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ORIGINAL ARTICLES.

PSYCHICAL RESULTS OF GYNECOLOGICAL OPERATIONS.

Read in the Section of Obstetrics and Diseases of Women at the Forty-first Annual Meeting of the American Medical Association, at Nashville, Tenn., May, 1890.

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It has become quite the fashion of late, on the part of anti-surgical gynecologists and others opposed to radical measures in the treatment of the diseases of women, to make suggestive allusion to the possibility of insanity, or other grave neurosis, following operations. This paper is accordingly presented to this Section, showing, as I believe it does, the real facts as known to-day upon the question: "Do psychoses follow gynecological operations?"

The advent of Apostoli's application of electricity, has also afforded an opportune moment for the anti-surgical practitioner to renew and reinforce himself against radical treatment. The brilliant claims of Apostoli, and the still more arrogant assumption of certain followers of the gifted electrician, would lead the casual reader and observer to the supposition that hysterectomy for myoma is no longer a necessity. It is, therefore, not surprising that between the two extremes, there should be an active argument in progress, and that there should be a tendency to urge rather extreme views in support of an opinion. The most important paper upon this subject appeared in the *Medical News* of April 13, 1889, having been previously read by Dr. T. G. Thomas, before the N. Y. Academy of Medicine, April 4. The paper claims to report twenty-six cases where severe psychical results followed gynecological surgery.

In the consideration of this subject, it appears to the writer but just that we limit this inquiry to operations which affect the uterus and appendages; such operations as oöphorectomy, ovariotomy, salpingectomy and hysterectomy, including Porro's operation. To go beyond this surely involves the danger of adding unimportant evidence for obvious reasons. Let us see how far the paper above alluded to conforms to this standard. Dr. Thomas reports six cases of grave psychosis, following gynecological surgery in his own practice. Of the six, one was an ovariotomy, one a Battey's operation, the third a trachelorrhaphy. The first was a patient of low grade of health, who was insane less than thirty-six hours, and died. Surely, this cannot have been merely insanity; there was evidently acute cerebral disease, at least as complication. The second case would appear to be a case in point, and is the only one of Thomas' six, which should be classified as possibly due to the operation. She made an excellent recovery. It is claimed that in no case could a history of heredity be obtained. In four of the six cases, *eccentricity* was observed prior to operation. Of cases noted in this interesting paper, one by Dr. Ill deserves notice. (See *Pittsburg Med. Review*, Vol. 2, 1888, p. 1.) Dr. Ill reports three cases occurring in his own practice. Case 1. Age 61. Fibro-sarcoma removed. Twenty days insane. Recovery. Case 2. Age 57. Ovarian cyst. Patient in bad mental state prior to operation. "Hopes to die under it." Both cases showed psychical symptoms immediately after removal of stitches. The second case had been tapped twenty-seven times in two years. Patient was insane only a short time. Can any one doubt the cause of insanity in this case? It would perhaps be well to have it generally known that insanity followed such temporizing as a rule. The third case was a "button hole" operation for cystitis. Patient recovered, although I claim the case as not properly classified.

Dr. Ill also briefly reports seven cases which were read before the Berlin Gynecological Society in 1887. Of these, only one operation affected the uterus, an amputation of the neck. One ovariotomy was followed by insanity, with fatal result. The remaining operations were upon the perineum, vagina and rectum. Five of these cases were seen in Dr. A. Martin's hospital, Berlin. In only one case upon the uterus or ovaries. (Reported by Czempin.) (Dr. Martin claims this case had history of prior tendency. See letter below.)

In 1888, Werth, of Kiel, read a paper before the German Gynecological Society, at Halle, in which he stated, that in three hundred operations on the female genital tract, he had in six instances observed psychical disturbances due to the operation. In two cases the operation was total extirpation of the uterus; in two, removal of the ovaries; and in two ovariotomy. One patient was violently excited before the operation. In five cases the mental disturbance took the form of melancholia, and one of mania.

In *American Jour. Obstetrics*, Jan., 1889, Fillebrown, of Hamburg, reports four cases observed by Prochownick. Case 1. Hysterectomy for fibromata. Patient single. Aged 45. Recovery interrupted, in the third week, by a small exudation in left side. Operation Feb. 19. Discharged well March 19. In July of the same year, melancholia. Her condition improved under treatment, but occasionally shows signs of mental distress. Shows aversion to men generally, and to physicians in particular. Case 2. Prolapsus uteri, and cystocele, with torn perineum. Operation June 16. Insanity at the end of September. Improvement in mental condition, but finally died of peritoneal cancer. Case 3. Catarrhal colitis and two abortions. Curetting of the uterus and development of ovarian cyst. Operation Sept. 19, 1889. Mental excitement in following December, increasing to mania, in a month. Slowly recovered. Had fear of cancer, and hysteria prior to operation. The fourth case. Age ——. Had eight abortions (?). Had a fibroma, which necessitated laparotomy for castration, March, 1887. Besides the ovaries, two small fibromata the size of large apples, and the tubes, with hæmato and pyosalpinx were removed. The first signs of psychical derangement occurred thirteen months after operation. The patient died, and at the autopsy, a cerebral tumor was discovered. Hæmorrhage was the immediate cause of death. Fillebrown well says that this last case of insanity was not due to the operation. He claims that if due to the operation, the psychosis should develop in four months or less. The age of two of these cases should relieve them of any suspicion of having been made insane by the surgical operations, as they were past the age of menstrual activity.

Fillebrown also reports three cases of interest, in that they developed insanity prior to operation. One rupture of ovarian cyst, just before operation was to have been performed. One week's illness. Recovery. Melancholia in two months. Recovery in three months. Another for ruptured extra-uterine pregnancy. Patient ill seven months. Melancholia in four months. Recovery. A third case, pyosalpinx, rupture, hæmorrhage, peritonitis, melancholia. History of heredity.

In the *British Medical Journal*, June 8, 1889, Dr. Thomas Keith, formerly of Edinburgh, but now of London, makes the following remarkable observation: "Even the fact that in my cases of hysterectomy, the removal of the uterus and ovaries was sooner or later followed by insanity, in 10 per cent. of the whole number, is enough for me to condemn any operation that removes these organs." This statement occurs in the famous declaration made by Dr. Keith (in the journal above quoted), that he has forsworn such formidable operations as hysterectomy, and ovariotomy, for fibroids. Coming, as this does, from so eminent an operator, and in every way so very popular, and highly esteemed gentleman, demands careful consideration, and does not admit of mere denial.

It is not surprising that our anti-surgical friends should take advantage of this statement, and we accordingly have seen it used already in opposition to radical treatment. The inquiry made in regard to this view of the case, has led to very careful search of the literature of the subject, and to my gratification, it is almost impossible to find upon record a well-authenticated case of insanity due to these operations. In point of fact, an operation to produce insanity, which should be without question owing to the operation alone, would of necessity be performed upon a healthy woman, which no operator would dare to undertake. If this view be not correct, the solution of the difficulty lies in the neurosis being merely a coincidence or accidental result.

The investigation has led the writer from a position of some skepticism, to one of positive conviction, that the position of Dr. Keith is untenable.

For a few moments we will see what representative surgeons and others have to say in view of Dr. Keith's statement. First, let us see what he says himself: "Of the six cases of insanity I had after hysterectomy, in two, the attacks were acute, during convalescence. Both died. One had been insane before — an acute attack—none of the others. Of the other four cases, two had attacks of acute mania, within a year after operation. One recovered, the other was still insane when I last heard of her; that was several years after operation. In the other two, the —— was chronic mania. . . . I had no cases of insanity after simple double removal of the ovaries; only after removal of both ovaries and the uterus. It is impossible for me not to connect at least three of the cases with the operation.

Dr. Bantock says: "I regard insanity following abdominal operations, rather as a coincidence than a consequence. I have not seen any cases, save those in which insanity was previously shown. One was a case who had been in an asylum, and the other was one of religious enthusiasm, rather than mania. The former, when last heard from, was as well as when she left the

Asylum. The latter is now quite well. Another case of supra-vaginal hysterectomy had hysterical mania for a few days, and a fourth was a bad case of ovariotomy, done during an attack of puerperal mania; the case doing well. There has been nothing in the experience of my colleagues at the Samaritan Hospital, to warrant any support to the statement in question.

Dr. A. Martin says: "I have been truly astonished to read Dr. Keith's statement. Among my own cases, out of whom over 1,000 have survived laparotomy, not one patient has been insane, where there had not been very marked symptoms of mental trouble before. Grave hysteria followed sometimes other operations, but here also not one quite healthy person has fallen ill in this way. The only exception I have seen is in rectal operations, removal of piles, and similar operations (which, indeed, I perform but quite exceptionally.) I saw acute mania, but also here there were prior symptoms, undoubtedly." This letter disposes of the statement made in Dr. Ill's paper (quoted by Thomas) that so many cases occurred in Dr. Martin's hospital.

Dr. Robert Battey says: "I rarely remove the uterus, and have not any case of insanity following operation upon any patient who was not previously insane; *per contra*, I have had a number of cases of reflex insanity which have been cured by operative interference."

Dr. T. A. Emmet says: "I have rarely done hysterectomy, and seldom remove the ovaries for any other condition than the one calling for ovariotomy proper. I have never seen, in my own practice, a case of insanity following any of these operations; nor do I know of an instance in the practice of any one else, after hysterectomy or ovariotomy. But I have known of several instances of acute mania, and a number of cases of melancholia, which have followed the operation for removing the tubes, and ovaries. I have seldom been called in consultation to see these cases, but have known from the friends of the regret [?] where I have refused to operate, and they have gone to others to have it done. Unfortunately, I am unable to furnish any statistics, and I wish our knowledge was more accurate; but I cannot divest myself of the belief, that a disturbance of the mind, in some form, has been a far more frequent occurrence after removal of the uterus and ovaries, than is generally supposed."

In the view announced by Drs. Bantock, Battey and others, that the cases of insanity following gynecological operations really preceded them, very many of our active surgeons concur; but to reproduce their opinion here would greatly lengthen this paper. In fact, there is no dissent whatever. But some may say, why do you not ask the alienists; for we have heard that many cases of insanity are found in our asylums, as a result of gynecological work? What do we find?

Dr. Alice Bennet, of the State Asylum, Norristown, Pa., says: "I have had three cases of insanity following removal of the ovaries. I am not willing to say that the operations were the cause." These cases are cited, but develop nothing unusual. These cases came under Miss Bennet's care after operation. It will be seen that Dr. Keith only claims three cases, as unquestionably due to the operation. Dr. Keith has had sixty-four cases of hysterectomy. His six cases of psychosis show but one with previous history of insanity. It is worthy of observation that he attaches no importance to the simple removal of the ovaries for fibroids, as a factor in the production of insanity, but emphasizes the point as important "only after the removal of both organs."

Dr. G. Alder Blumer, Supt. of the N. Y. State Asylum says: "Replying to your recent inquiry in reference to gynecological operations in their relation to insanity, I have to state, that, while we have had a few cases in which such operations were assigned as the exciting cause, the patients have generally been unstable normally, and predisposed to insanity by heredity."

In conclusion, it appears but fair to claim that there is but slight evidence of insanity resulting from gynecological work. If all the factors which enter into the causation of such psychical disturbance are considered, it is quite probable that but slight evidence will be found to support the theory of cause and effect, or that insanity is directly produced by the operation. Thus we know that in any surgery we have psychical disturbances from anæsthesia, shock or use of toxic substance, such as iodoform, etc.

Again the overwhelming statistical information at hand, showing how many women are insane owing to disease of the generative organs, alone; and, also, the number cured by the proper treatment of their diseases, should forever silence any captious criticism of this surgery.

Few facts in medicine are so well established as, that scores of women are being rescued from insanity and some of the protean forms of hysteria, by the gynecologist. The fear that insanity may result from the operation should never deter the surgeon from its performance; for if in doubt about it, there must need be positive reason to suspect a mental trouble, which, according to the almost universal experience of the profession, is caused by the disease in question, and is not to be prevented by the delay of the treatment.

At the Medical Congress of Cuba Dr. Lyada read a paper on yellow fever, which disease he affirms not to have existed in Cuba before the African immigration.

A PLEA FOR EARLY LAPAROTOMY IN INTESTINAL OBSTRUCTION.

Read in the Section of Surgery at the Forty-first Annual Meeting of the American Medical Association, held at Nashville, Tenn., May, 1890.

BY J. G. CARPENTER, M.D.,
OF STANFORD, KY.

Bantock, of England, and Joseph Price, of Philadelphia, have written most beautifully, eloquently and forcibly upon this subject, "A Plea for Early Ovariotomy," and have conclusively demonstrated that the best and most favorable time for ovariotomy, is when the diagnosis is made, and before complications and structural lesions have taken place in adjacent and remote organs, and when the patient is in the best possible condition for operation. How true and applicable these remarks are to the subject of intestinal obstruction, is only correctly appreciated by the abdominal surgeon.

Surgery has made giant strides, and in no special field has there been more advance than in intestinal surgery. In every medical society there should be read a paper written on my subject, viz.: "A Plea for Early Laparotomy in Intestinal Obstruction." The mortality from delay, incorrect diagnosis, timidity, ignorance and prejudice in the past, has been very high and fearful. To-day, we have a reliable, safe, speedy and accurate method of diagnosis of intestinal obstruction, viz.: Senn's hydrogen gas inflation of the intestines and the location of the obstruction in the large or small intestine. All praise is due Senn for his inventive genius, originality, and experimental research in intestinal surgery. If intestinal obstruction is suspicioned, the permeability or non-permeability of the intestinal canal and the diagnosis of obstruction can be made in less than an hour, the hydrogen gas can be generated in ten minutes; in ten to twenty minutes, more or less, the bowels can be inflated, the gas escape from the mouth through the tube inserted in the stomach and ignited, which gives a blue flame, if no obstruction exists; otherwise, the indication, is to operate at once, and before inflammatory and structural lesions have taken place.

Keith, in speaking of the failures of abdominal surgery and hinderances to its progress, states, most of the mischief has been done by the surgeon himself. Time waits for no surgeon: "Delays are dangerous." "Procrastination is the thief of time." Formerly the phrase, obstructed bowels, was synonymous with death; to-day it means, use the test, operate, remove the cause and let the patient live. When done early, and by expert surgeons, and before structural lesions have formed, laparotomy for an intestinal obstruction will have as small a mortality as ovariotomy, or abdominal section for the removal of the uterine appendages. The physician of the present and future who is not equipped to make the special diagnosis of obstruction, operate for its removal, or, have a surgeon operate, and before serious tissue lesions have taken place, is most certainly highly culpable and direlect of duty. The best time to operate is when the diagnosis is made, and made early.

Dr. Joseph Price said he would make no delay by taxis for the reduction of strangulated hernia, but operate at once for its relief, and for the radical cure. Wyeth states, "do not wait longer than the lesion of intussusception is recognized; within the first twenty-four hours the prognosis will be more favorable, and the danger of a fatal termination will be increased with each day thereafter." If volvulus is not removed within a few hours by other treatment, abdominal section should be performed, the hand introduced and the loop untwisted. Constriction by bands, the vermiform appendix, the pedicle of an ovarian or uterine tumor, the Fallopian tube, diverticula, strangulation through slits in the omentum and mesentery and adhesions between the contiguous loops of intestines demand early operative interference, as do all other forms of intestinal obstruction. That taxis should not be done longer than five or ten minutes at any one effort, and that it may be repeated at intervals of half or one hour within the first six hours of the history of strangulation, and after twelve hours should not be practiced. The majority of cases which end fatally are those in which strangulation had existed twelve or twenty-four hours or more, and before surgical interference. Abdominal section, in a patient not exhausted by suffering or disease under asepsis and antisepsis, is almost free from danger, when done early by a surgeon skilled in the technique of intestinal and abdominal surgery.

Scientifically practiced massage and taxis have a limited range of application in the treatment of intestinal obstruction, are applicable to cases of obstruction due to a foreign body, an enterolith or fæcal accumulations, and should only be resorted to before inflammatory changes have developed at the seat of obstruction and while patient is under anæsthesia.

The rule now is, not to wait hours or a day to do taxis, but do it only fifteen minutes, and never over thirty. Senn states true intestinal obstruction, whatever its cause may be, is as strictly a surgical affection as strangulated hernia, and remediable only by the same kind of surgical treatment. To let a patient die of the consequences of a removable cause of obstruction without an operation is a reflection upon the advances of modern aggressive surgery.

In doing an abdominal section for obstruction, the aim of the surgeon should be to save life, operate quickly, safely and cautiously, and not do an ideal operation, but economize time, minimize shock, lessen the stage of anæsthesia, prevent

unnecessary extrusion of bowels, and protect them with hot aseptic towels, irrigate with hot aseptic water, and prevent complications, making all the details of the operation aseptic, from beginning to end.

Insufflation of hydrogen gas is a valuable means of diagnosis in locating the seat of obstruction before tympanites has set in, and is best adapted at a time when most needed during the early stage of intestinal obstruction. If the colon dilates uniformly from the sigmoid flexure to the cæcum the obstruction must be sought higher up in the intestinal canal. The passage of gas through the ileo-cæcal valve, rendered incompetent by distention of the cæcum, is always attended by a characteristic gurgling or blowing sound, which is heard distinctly by applying the ear or stethoscope over the ileo-cæcal region. The sounds may be heard several feet away.

If the gas passes the ileo-cæcal valve, a pressure not in excess of that required to overcome it in a state of health, and if after inflation a thorough examination of the ileo-cæcal region by inspection, palpation and percussion reveals nothing abnormal, the search for the obstruction is continued by inflating the small intestines slowly, and making frequent examinations of the abdomen to ascertain the height to which inflation has been made, and to study the relative position of the different abdominal organs. Inflation is also a useful diagnostic resource in locating the obstruction during laparotomy for intestinal obstruction. The intestine below the seat of obstruction is always empty, collapsed and anæmic, as compared with the portion above the obstruction. When the obstruction is located high up in the intestinal canal, and the tympanites is extensive, the empty portion of the small intestines, has, by compression become displaced, and is often not readily found. In such cases the distension of the bowels from below will indicate to the surgeon at once the location and length of the intestine below the seat of obstruction, and will enable him to search for the obstruction from below upwards. The manipulation of the healthy intact portion of the intestinal canal in the search for the obstruction is by far a less hazardous procedure than the handling of the distended portion above the obstruction, rendered paretic, exceedingly vascular, and much softened by the obstruction. In cases where we suspect the presence of a perforation, inflation will demonstrate not only its existence, but also its location. Invagination is rare above the ileo-cæcal valve, and its location can be determined by inflation with hydrogen gas, and if resorted to early, it may prove the means of effecting reduction. In ileo-cæcal and colonic invagination slow and persistent distention of the colon with hydrogen gas, with the patient completely under the influence of chloroform, is the safest and most efficient means of effecting reduction, and should always be resorted to whenever these conditions are recognized or even suspected.

Rectal inflation, as ordinarily practiced by forcing air into the rectum with bellows, or a Davidson's syringe, is not devoid of danger, as the force employed cannot be accurately regulated, or estimated. Insufflation of hydrogen gas from a rubber balloon is applicable in all cases of sub-acute and chronic invagination, and during the early stage of acute invagination, that is, before the passive hyperæmia in the invaginated portion has rendered reduction by this method impossible.

Should perforation take place, the accident is at once recognized by a uniform distension of the abdomen, from the entrance of the hydrogen gas into the peritoneal cavity, as well as by a sudden diminution of pressure readily felt by the person who makes compression of the balloon. The entrance of hydrogen gas into the peritoneal cavity is in itself a harmless occurrence, as the gas is non-irritant and perfectly aseptic. In such cases the insufflation must be followed at once by abdominal section and the necessary operative treatment of the invagination. (Senn.)

Senn states, intestinal obstruction irrespective of its cause is always followed by a series of consecutive pathological changes which independently of the partial or complete interruption of the passage of intestinal contents tends to destroy life.

The dilatation of the intestinal tube on proximal side of the seat of obstruction may give rise to such a degree of abdominal distension as to destroy life from suspension of important functions by mechanical pressure. In acute obstruction, the violent peristalsis on the proximal side of the occlusion causes an increased afflux of blood to the portion of bowel, the seat of exaggerated physiological function, which after cessation of peristaltic action remains in an intense venous and capillary engorgement. Hence transudation and exudation readily take place into the paravascular tissue, which combined with the capillary stasis attending this stage of the inflammatory process, often results in gangrene. The intestinal wall, in a state of inflammation, becomes permeable to pathogenic microörganisms, which after passing through the entire thickness of its wall enter the peritoneal cavity and induce septic peritonitis—a frequent immediate cause of death.

These facts are cogent reasons for adopting surgical measures in all cases of intestinal obstruction due to mechanical causes as soon as a probable diagnosis can be made. If this were done, the two greatest sources of immediate danger attending and following laparotomy, shock and septic peritonitis, if not entirely avoided, at least would be less likely to occur, and the tissues, the

seat of operation would be in a favorable condition for direct treatment.

Every physician, as a rule, on graduation appropriates to himself the prodigious title of surgeon. One may do some fair and moderately good general surgery, yet be an inferior, or bad abdominal surgeon, and unless he has had special training, practical experience, understands the technique of intestinal obstruction and prepared to meet every contingency that might arise and be master of the situation, he should not attempt the abdominal section.

In no other specialty do so many stupendous and hydra-headed complications arise, both in the obstruction and its cause. Opium, in the treatment of intestinal obstructions, should be numbered with the past. No physician has the moral or professional right to narcotize a patient, obscuring symptoms, which were they allowed to arise, would be highly indicative of surgical interference, causing his patient to sleep the sleep that knows no waking and leaves him a victim to narcosis in the valley and shadow of death.

Early diagnosis and early operation before structural lesions have occurred, when the patient is in the best possible condition for operation by a surgeon skilled in all the details of abdominal and intestinal surgery, who operates quickly, safely, expeditely, economizing time, minimizing shock, lessening the stage of anæsthesia and the protection of the viscera under aseptic precautions, little or no taxis and the technique of the operation having been so much simplified by Senn's intestinal anastamosis, lateral apposition, lateral implantation and intestinal exclusion and Senn's modification of Jobert's operation by circular enterorrhaphy will greatly lessen the mortality of intestinal obstruction in the future.

INTUBATION WITHOUT THE USE OF THE GAG OR EXTRACTOR.

Two Improvements on the Common Method, described in the Section on Surgery, at the Forty-first Annual Meeting of the American Medical Association, Nashville, Tenn., May, 1890.

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Intubation has not as yet fulfilled the expectations of the medical profession. The relief after intubation is not so complete or so immediate as after tracheotomy; the membrane and mucus occlude the tube, and cause coughing and distress. Frequently the tube must be removed, cleansed, and again inserted. Nor has the difficulty of swallowing with the tube in the larynx as yet been overcome. Dr. W. E. Casselberry, of Chicago, two years ago recommended feeding the patient while the head is reclined downwards.

But at this time, I only wish to speak of two simplifications in the method of intubation, which render it one of the easiest of surgical procedures.

I discard both the gag and the extractor. The father or the nurse takes the child on his lap, holding firmly the little hands, as for an ordinary examination of the mouth or the throat. When the child opens its mouth, I pass the left index finger quickly into the mouth and behind the root of the tongue. Gagging follows and the larynx at once rises to the waiting finger. At this moment I put the tube in the larynx with the right hand, retaining it in place with the left index finger, withdrawing the instrument at once. This is done with such ease and quickness the child is scarcely aware of the operation, and does less resist when intubation is necessary a second time. Certainly the child will cough and make efforts to expectorate, but *gagging* is a sure sign that the tube has missed its proper place.

With an instrument in the child's mouth to hold the jaws apart, gagging is incessant, and the little one is excited and uncontrollable. Force then becomes necessary, which is manifestly dangerous in such a disease as diphtheria. But if the gagging is incited by the operator's finger, he is ready for the rising larynx, and can at once insert the tube.

There is no biting for a few seconds after the finger is thrust into the larynx; this we know from the practice of the veterinary surgeons, who thrust their pills and boluses at arm's length into the throat of the most vicious horse; the finger, however, may be protected by wrapping of adhesive plaster in front of the knuckle, as I always do.

I regard this method of intubation as the ideal operation for about 95 per cent. of all cases. By this way I have hardly ever caused any bleeding or discomfort to the child. It is done so quickly and so easily that the parents frequently express their astonishment, when told that the tube is inserted. I do not claim any special skill or training in introducing the tube into the larynx; the ease and success is all to be attributed to the method.

Occasionally the epiglottis remains adherent to the glottis; in such a case, the operator has only to raise the epiglottis from the side, causing a delay of about half a second. Or the child may be asphyxiated to such an extent that it does not gag; in that case the glottis does not meet the finger-tip, and the operator advances his finger along the anterior wall of the pharynx until the glottis is felt, and the tube is inserted.

The most common error is in introducing the finger too far behind the root of the tongue. The distance from the teeth to the larynx is from 3 to 3½ inches, according to the age.

Denhardt's gag serves an excellent purpose; nevertheless, the following advantages are apparent, and may be claimed, for my method of intubation without the gag:

1. The operator does not need an assistant.

2. The child is not excited, and does not dread a repetition of the operation.

3. The tissues of the pharynx and larynx are not injured by sudden and unexpected motions of the child. I have intubated in this way over a hundred times; it does not take me longer than three seconds. I have been successful in the first attempt—except in two or three asphyxiated cases. My last case was of that kind.

To those not accustomed to the feeling of the child's glottis, I may say that it gives the same sensation to the finger as the os uteri. If it feels smeary, we may know that the suffocation is due to membrane rather than to œdema; and so, by the touch, we get a valuable symptom for the prognosis.

The second improvement of the customary method of intubation, is in the removal of the tube by pressing it out of the larynx by grasping the larynx externally with the fingers, thus discarding the extractor entirely.

The writers on intubation, O'Dwyer, Dillon Brown, Waxham, and others, all concede that the application of the extractor is more difficult than intubation itself. Then why use an extractor at all, if it may be dispensed with? I simply squeeze the tube from without up to the fauces, and hook it from the mouth with the finger. I have done so in five cases where removal with the extractor had repeatedly failed. In one case, the neck was sore from blistering, and in another case the tube selected was too large for the larynx; nevertheless, removal did not cause much pain or discomfort.

I fasten the thread to the cheek, as in my earlier cases, I feared losing the tube—one was in the intestine ten days—and now fastening the thread has become a habit with me. Several times I have removed the tube so as to feed the patient; I do not know if this is advisable, as repeated intubation causes irritation.

In conclusion, I may say that since I have discarded the gag and extractor, intubation is easier to me than catheterization of the female bladder.

Intubation did not increase very much the percentage of recoveries in my practice. The most of the children have died; but intubation could not be blamed for that—except in one case, where the boy, 18 months old, was allowed by his mother to swallow too hastily.

I saw a case where gangrene followed diphtheria, destroying all facial muscles on one side, then the eye, and then, entering the brain, finally killed the boy.

I saw in another case, the whole parotid fall out in one piece, and recovery followed. I had a case in which two distinct places with a dull sound could be sharply circumscribed on the chest, and there I refused intubation. Three days afterward the same places were tympanitic, and strong emetics saved the girl's life. The sharply circumscribed infiltration, and the change from the dull to the tympanitic sound, make evident the diphtheritic nature of the infiltration. In short, diphtheria in the last years showed a more malign character in Indiana than before.

In all cases, the parents have expressed their thanks that everything had been done for the dear ones, but said that for the death we could not be responsible.

Just because we must do something in these hopeless cases, and just because we cannot promise much, therefore our doing should be very mild, and my improvements in intubation may become valuable to the practitioner.

DIAGNOSIS AND OPERATIVE TREATMENT OF GUNSHOT WOUNDS OF THE STOMACH AND INTESTINES.

Read by Invitation in the Surgical Section of the Tenth International Medical Congress, August 8, 1890.

BY N. SENN, M.D., PH.D.,

OF MILWAUKEE, WIS.

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The existence of a visceral lesion of the stomach or intestines must be suspected in every case where a bullet penetrates the abdominal cavity; hence the first step in the diagnosis of gunshot injuries of these organs must be directed towards establishing the fact that penetration has occurred.

DIFFERENTIAL DIAGNOSIS BETWEEN NON-PENETRATING AND PENETRATING GUNSHOT WOUNDS OF THE ABDOMEN.

This part of the diagnosis may be easy or difficult, according to circumstances. If the bullet has passed through the body, and the wounds of entrance and exit occupy such positions that a direct line connecting them will necessarily pass through the abdominal cavity, there can be but little doubt that both abdominal walls have been perforated at opposite points, and that the bullet has traversed that part of the peritoneal cavity interposed between them. In obese persons, the exact outlines of the peritoneal cavity cannot be located with absolute accuracy, and on this account some doubt may remain, in case two bullet wounds, made by a single bullet, are found over the anterior or lateral aspect of the pendulous abdomen, whether the peritoneal cavity between the wounds of entrance and exit falls in the track made by the bullet.

In a case of this kind that recently came under my observation, I decided this important question by injecting hydrogen gas into the wound of entrance. A glass tube corresponding to the size of the bullet was connected with the rubber tube of a rubber balloon in which the gas was stored, and was inserted into the wound of entrance; by

gently compressing the balloon the gas was forced along the track made by the bullet until it escaped at the wound of exit, which demonstrated that the wounds communicated with each other, and consequently must have been made by the same bullet. In order to show conclusively that the peritoneal cavity had not been opened at any point along the track made by the bullet, the wound of exit was closed by compression, made with self-locking hæmostatic forceps, and insufflation was resumed. After the wound had become fully distended, the resistance to the escape of gas was suddenly increased, which would not have been the case had the peritoneal cavity been opened, as in that case the gas would have escaped into the peritoneal cavity, making a free tympanites which could have been easily recognized by the usual physical symptoms. Instead of this condition, however, a circumscribed area of emphysema was caused by a continuation of the insufflation, which, with the absence of a free tympanites and the escape of gas at the wound of exit, I regarded as a positive evidence that penetration had not occurred. The wounds were not drained, but were treated and dressed in accordance with strict antiseptic precautions, and healed by first intention.

The use of the probe in such cases is of no value whatever in determining the existence or absence of penetration, and a reliance upon it as a diagnostic measure may lead to serious errors, both in diagnosis and treatment. Air should never be used for insufflating a bullet track for diagnostic purposes, as the air injected might become the direct means of infection. Hydrogen gas is a non-toxic, aseptic substance with valuable inhibitory antiseptic properties; qualities which render it the most desirable substance to be used for inflating tubular wounds for diagnostic purposes.

Wounds through the body made with a bullet, in parts of the abdomen where, from the direction of the track, it is not certain whether or not the peritoneal cavity has been opened, call for a most careful examination to determine this point. If this cannot be done satisfactorily with the hydrogen gas test, the course of the bullet must be followed by a careful dissection from the wound nearest the point where we have reason to suspect a tear or perforation of the parietal peritoneum. If only one wound, the wound of entrance, is present, the question of penetration depends upon the shape and size of the bullet, the distance from which and direction in which the shot was fired, the amount and nature of the clothing covering the point of impact, the position of the patient at the time he received the injury, and the anatomical character of the parts interposed between the wound of entrance and the abdominal cavity.

1. *Shape and Size of the Bullet.*—Other things being equal, the larger the bullet the greater the probability of deep penetration, as in the present construction of firearms the amount of powder in the cartridge is proportionate to the weight of the bullet. A conical bullet penetrates more deeply than a round bullet of equal weight. At close range, bullets fired from firearms of the smallest calibre possess sufficient force to penetrate the soft tissues of the thickest abdominal wall. In my experiments on dogs with different sized shot, I used a double-barreled shotgun, No. 12 gauge; the cartridges were charged with the usual amount of powder used for duck hunting, and contained from four to twelve shots. The dogs were etherized, strapped on a Pasteur table and placed in an erect position, and the shooting was done at a distance of twenty feet. The largest shot, calibre 18, often passed through the body, if no bone came in its way, while even No. 8 shot invariably penetrated the anterior abdominal wall.

2. *Distance and Direction of the Bullet.*—In reference to the distance at which the shot is fired, the result will be largely influenced by the size and shape of the bullet and the quantity of powder used in the charge. A 38- or 45-calibre conical bullet propelled by the explosion of sixty to seventy grains of powder, fired at a distance of two hundred paces, will not only penetrate the abdominal cavity, but will pass through the body if its course is not impeded by the ribs, spinal column, or pelvic bones; while a round bullet of 22-calibre may fail to pass through the fleshy part of the abdominal wall at a distance of ten to twenty paces. In my experiments on the cadaver I used a 22-calibre Stephenson rifle and conical bullets. The cadaver was placed in the erect position, and the bullet was fired at a distance of twenty feet, directly in front of the subject. In every instance the bullet perforated the anterior abdominal wall, passed across the peritoneal cavity, and was found lodged at variable depths in the posterior abdominal wall.

The direction of the bullet plays an important part in the differential diagnosis between penetrating and non-penetrating wounds of the abdomen. A bullet fired in a direction which corresponds with the shortest and most direct route from the surface into the peritoneal cavity is most likely to cause a penetrating wound. Thus, bullets will enter the abdominal cavity with a minimum degree of force if in their course they pass through the thinnest portion of the abdominal wall, which corresponds with the linea alba and, notably, the umbilicus. A bullet taking a less direct route, especially if of small calibre or if fired at great distance, may become arrested in its course after passing through from two to six inches or more of soft tissues before it reaches the abdominal cavity. A bullet may reach the abdominal cavity even if the external wound be located a considerable distance from this cavity. In one of my cases, a suicide, the bullet entered the

cavity of the chest on the left side, passed through the lower lobe of the left lung, and entered the abdominal cavity through the diaphragm, where it perforated the stomach from above downwards. Perforation of the intestines may also take place in the lowest part of the abdominal cavity by the passage of a bullet through the pelvic structures, the external wound being remote from the perforation in the parietal peritoneum and the visceral lesions.

3. *Amount and Nature of Clothing at Point of Impact of Bullet.*—Many lives have been saved by thick, firm clothing breaking the force of the bullet, which then causes an ordinary, innocent flesh-wound instead of a penetrating wound, which would have been caused had the surface been less efficiently protected. In other cases the injury was modified by the bullet impinging against a button, belt, buckle, note- or pocket-book, which not only diminished the force of the missile, but changed its course from a direct route into the abdominal cavity into an oblique direction through its wall. The suicide who wants to make sure of the deadly intent upon his own life should divest himself of the clothing covering the heart, so as to remove any obstacles which might deviate or diminish the force of the bullet.

4. *Position of Patient.*—In every case of gunshot wound of the abdomen it is important to ascertain as nearly as possible the exact position of the patient at the instant the shot was fired, as information thus obtained will be of great value in determining beforehand the probable course of the bullet. It is on account of the change of the relative position of the parts after the infliction of the wound that the track made by the bullet cannot usually be followed with a probe, as by the change in the position of the muscles, and by the sliding of fascia and skin, obstructions are formed in different parts of the tubular wound. Remembering the exact position of the patient and his assailant, and imagining the direction of the bullet, its course through the tissues can be ascertained with at least an approximate degree of accuracy.

5. *Anatomical Character of Parts Interposed Between the Wound of Entrance and Abdominal Cavity.*—A conical bullet of large calibre, fired in close proximity to the body, will penetrate the tissues irrespective of their anatomical character and without deflection. Deflection of small bullets, and of large bullets fired at a considerable distance, is occasionally caused when they strike a smooth bony surface at an oblique angle, an occurrence which abruptly deviates the course of the missile. McGraw, of Detroit, has shown experimentally that deflection of bullets does not take place as often as had been formerly supposed. We have no reason to believe that the soft tissues of the abdominal wall, under any circumstances, offer sufficient resistance to change the course of a bullet. A partially spent bullet striking obliquely against the convex surface of the ribs, or against the spinous or lateral processes of the vertebræ, or the pelvic bones, may deflect a bullet in its course, and what appears upon first sight a penetrating wound may be simply a wound of the abdominal wall, with the bullet lodged in the tissues at a considerable angle from the line of entry. Deflection should therefore be thought of as a possible occurrence only when the bullet has entered the body and has met with a bony resistance in its course towards the peritoneal cavity.

Exploration of Parietal Wound.

Examination of gunshot wounds of the abdominal wall must be made with special reference to a positive differential diagnosis between penetrating and non-penetrating wounds. The diagnostic aids which I have just enumerated should be applied in every case before any attempt is made to demonstrate the depth and course of the wound by digital or instrumental exploration. A positive diagnosis must, however, be withheld until the exact course of the bullet has been revealed by a careful exploration of the wound-canal from the point of entrance of the bullet to the peritoneal cavity, if the bullet has penetrated, or sufficiently far to prove that the abdominal cavity has not been invaded.

Certain precautions should never be neglected during the first examination of gunshot wounds of the abdomen. In the first place, undue haste must be scrupulously avoided. A wound of the abdominal wall should never be touched without first procuring for the wound of entrance and for the surface a considerable distance beyond it, a perfectly aseptic condition by thorough disinfection. The parts should be scrubbed with warm water and potash soap, and then washed with a 1–1000 solution of corrosive sublimate, or a 5 per cent. solution of carbolic acid. The surgeon's and assistants' hands should be rendered aseptic in the same manner, special care being taken to disinfect the spaces underneath the finger-nails. Digital or instrumental exploration of gunshot wounds of the abdomen without the necessary antiseptic precautions must be regarded, in the light of modern surgery, as nothing less than criminal negligence, and such recklessness may become the direct cause of a fatal wound complication in case of injuries which, if treated upon strict antiseptic principles, would have resulted in recovery. The instruments used in exploring the wound must be rendered aseptic by boiling them for at least five minutes, or by passing them through the flame of an alcohol lamp.

If a large bullet has penetrated the abdominal cavity by the shortest possible route through a thin portion of the abdominal wall, the fact that penetration has taken place often becomes evident by prolapse of the omentum into the wound-canal.

In such a case, the surgeon verifies the diagnosis by seizing the visible portion of the omentum with a pair of dissecting or hæmostatic forceps, and by making traction, pulls the omentum further into the wound for identification. The appearance of the structure, as well as the course of the blood-vessels, will enable him to decide whether the prolapsed tissue is a part of the omentum, or a piece of fat from the subperitoneal fat or the panniculus adiposus. If the part under examination proves to be the omentum, the existence of penetration has been conclusively demonstrated, and the proper treatment for penetrating wounds is at once to be carried into effect.

The cases where such a rapid differential diagnosis between non-penetrating and penetrating gunshot wounds of the abdomen can be made, are comparatively few. In the majority of cases, exploration of the wound by a careful dissection furnishes the only positive and reliable means in determining that the bullet has entered the peritoneal cavity.

Digital exploration of the wound should never be relied upon in ascertaining the depth and course of the wound, as this procedure is not infallible in making a correct diagnosis, and as, in case the bullet has penetrated the abdominal cavity, the finger may push before it and into the peritoneal cavity infected foreign substances.

The use of the probe should be discarded in the examination of gunshot wounds of the abdomen for diagnostic purposes. The wound-canal is often so tortuous from displacement of the tissues forming its walls that it cannot be followed with a probe without fear of making false passages, an occurrence which could not fail to lead to erroneous conclusions in reference to the extent and course of the wound, and in regard to the presence of visceral complications which might demand prompt operative treatment.

In every case of gunshot wound of the abdomen, the track made by the bullet must be followed by enlarging the wound by an incision at least two inches in length, which should intersect the perforation where its diameter is greatest, and in the direction of the principal muscle involved by the perforation. Before this is done all the preparations for a laparotomy should have been completed, everything required in the treatment of visceral wounds should be on hand, and the consent of the patient and his friends obtained to proceed and do what may become necessary in case it is found that the bullet has entered the abdominal cavity and has caused visceral injuries which demand surgical interference.

It is often not an easy task to follow the track of a bullet with the scalpel through a thick abdominal wall. The best method of procedure is to insert a grooved director as far as it will pass without resistance, and then divide the tissues layer after layer, catching bleeding vessels with hæmostatic forceps as fast as they are cut, in order to keep the field of operation as nearly as possible in a bloodless condition. The bullet frequently discolors the tissues, and these discolorations are often important landmarks in following the wound. The divided tissues are held out of the way with sharp-toothed retractors, in order to enable the operator to follow the course of the bullet with his eye as well as with his instruments. When the point of the director is reached it becomes necessary to make a close inspection, and under no conditions should the knife be used until the wound-canal can again be identified and followed with the eye or the director. The dissection is to be made carefully and slowly until the opening in the parietal peritoneum is reached, which completes the first part of the diagnosis. In non-penetrating wounds the dissection is carried down to the bullet, which is then removed. In case this is not practicable on account of the location of the wound, the nature of the parts involved, or the length of the track, it is extended sufficiently far to satisfy the operator that the abdominal cavity is intact. The operation is completed by adopting the usual treatment for non-penetrating wounds. By following the methods above described in differentiating between a non-penetrating and penetrating gunshot wound of the abdomen, the surgeon is able to make a positive anatomical diagnosis, and in either case to adopt and carry into effect a rational plan of treatment.

1. Diagnosis of Visceral Wounds of the Stomach and Intestines.

Quite recently the assertion has been made by several good surgeons that laparotomy is a justifiable procedure in every case of penetrating gunshot wound of the abdomen, and the claim is made at the same time that a bullet which enters the peritoneal cavity must almost of necessity inflict visceral injuries which require direct surgical treatment. The statement must, however, be accepted as true, that in the absence of serious visceral lesions, penetrating gunshot wounds of the abdomen are injuries from which the patients are very likely to recover without operative treatment, and that when such patients are subjected to laparotomy, death may occur in consequence of the operation, and not as a result of the injury. An injury of this kind is a subcutaneous lesion which usually heals without any inflammation or suppuration, provided the bullet has not carried with it into the abdominal cavity foreign infected substances. I am firmly convinced that in most cases of spontaneous recovery after penetrating gunshot wounds of the abdomen, the favorable termination was due to the fact that the bullet did not produce any visceral lesions of the gastro-intestinal canal. In two of the six cases of gunshot wound of the abdomen which have come under my observation during the last three years—and

which will be reported further on—the absence of perforating wounds of the stomach and intestines was demonstrated by the hydrogen gas test, and both of these recovered. This appears like a large percentage, but my own experience so far has been in direct contrast with the assertions of a number of surgeons that all penetrating wounds of the abdomen require treatment by laparotomy.

Experiments on the Cadaver.

In order to throw more light on this important subject, I made a number of experiments on the cadaver to determine the frequency and number of visceral wounds of the stomach and intestines that may be expected in cases of penetrating gunshot wounds of the abdomen when the course of the bullet can be determined beforehand. These experiments I will relate very briefly.

The cadaver was suspended and placed in the erect position against a wall. The shooting was done at a distance of ten feet with a Stephenson rifle, carrying a 22-calibre conical bullet. The rifle was held on a level with the wound of entrance, so as to give to the bullet as nearly as possible an exact antero-posterior direction; that is, it was intended that the wound in the anterior abdominal wall should be on the same level as the wound in the posterior wall. As the experiments were made from one to three days after death, the abdomen was in every case somewhat distended by accumulation of gas in the intestines.

Experiment 1.—Male, fifty-four years, dead twenty-four hours, emaciated, rigor mortis well marked. Bullet entered through the linea alba, 1.8 cm. below the umbilicus. The abdomen was opened at once, and it was ascertained that the bullet had passed between the transverse colon and small intestine without causing any visceral injury, and had lodged in the posterior abdominal wall.

Experiment 2.—Male, forty-five years, dead thirty-six hours, very little emaciation. Wound of entrance 4 mm. to the right of the median line and 8.5 cm. below the umbilicus, producing in its course through the abdominal cavity one perforation on convex border of loop of small intestine, one perforation of the sigmoid flexure, and a wound in the upper portion of the bladder, which was found adherent to a loop of the ileum.

Experiment 3.—Male, thirty years, dead thirty hours, fairly well nourished. Entrance of bullet 4.5 cm. to the left of linea alba and 2 cm. below the umbilicus. Result: four perforations of the small intestine at mesenteric border, one on convex side, and one through the centre of adjoining loop.

Experiment 4.—Male, sixty years, dead eighteen hours, advanced marasmus. Bullet entered 7 cm. to the left of middle line and 1.5 cm. below the level of the umbilicus, causing three perforations in adjoining loops of intestine.

Experiment 5.—Male, forty-six years, dead twenty-four hours, greatly emaciated. Wound of entrance 5 mm. to the left of the median line and 1 cm. above the umbilicus, producing a double perforation of the transverse colon.

Experiment 6.—Male, thirty-five years, dead eight hours, well nourished, considerable tympanites. Ball entered 7.5 cm. to the right of the middle line and 15 mm. above the umbilicus, making in its course through the peritoneal cavity a marginal wound of the transverse colon.

Experiment 7.—Male, fifty-six years, dead eighteen hours, pronounced emaciation. Entrance of bullet 6 cm. to the left of linea alba, and 3 cm. above the level of the umbilicus. No visceral injuries could be found on most careful inspection of the abdominal cavity, the bullet having passed between the transverse colon and the small intestine.

Experiment 8.—Male, forty years, dead twenty-four hours, moderate emaciation. Wound of entrance 1.2 cm. to the right of median line, and 2.5 cm. below the umbilicus. Examination of the abdominal cavity showed absence of any visceral injuries that would require surgical treatment, the bullet having passed through a triangular space formed by two adjoining loops of small intestine and the transverse colon.

Experiment 9.—Male, thirty-seven years, dead thirty-seven hours; no emaciation. Bullet entered 9 mm. to the right of the median line and 2.5 cm. above the umbilicus. Liver much enlarged, and stomach dilated so that the great curvature extended below the level of the umbilicus. In searching for visceral injuries it was found that the bullet had passed through the margin of the liver close to the suspensory ligament, above the lesser curvature of the stomach, perforating at the same time the head of the pancreas.

Experiment 10.—Male, twenty-five years, dead thirty-six hours, well nourished. Wound of entrance 3.9 cm. to the left of the middle line and 9 mm. above the level of the umbilicus. The internal injuries produced consisted of one marginal wound and three double perforations of the small intestine, with two wounds of the mesentery.

Experiment 11.—Male, forty-nine years, dead thirty-two hours, moderate emaciation. Bullet entered 3 cm. to the left of the median line and 3.3 cm. above the umbilicus, passing in its course through both walls of the cardiac extremity of the stomach near the great curvature.

Experiment 12.—Male, sixty-two years, dead seventy-two hours, considerable obesity. Wound of entrance 7.5 cm. to the right of the median line and 3.1 cm. above the umbilicus, causing a wound of the right lobe of the liver and passing through the lower segment of the right kidney.

Experiment 13.—Male, forty-one years, dead twenty-three hours, extreme emaciation. Ball entered 9 mm. to the right of the median line and

3.6 cm. above the level of the umbilicus. The only internal injury found was a small wound at the very margin of the left lobe of the liver, the bullet having passed between the pyloric extremity of the stomach and the transverse colon.

Experiment 14.—Male, thirty-six years, dead twenty-eight hours, moderate emaciation. Wound of entrance 4.2 cm. to the right of the median line, and 3 mm. above the umbilicus, passing through the transverse colon.

The result of these experiments confirmed me in the opinion that I have entertained for years, that a bullet passing through the abdominal cavity does not produce visceral injuries as constantly as we have been taught to believe. It will be seen from the experiments that in four instances, experiments 1, 7, 8, and 9, the bullet passed through the abdominal cavity in an antero-posterior direction without causing any visceral injury which would require surgical interference. In experiment 13, the bullet grazed the margin of the liver, producing an insignificant wound which could not have given rise to more than trifling hæmorrhage, and which would have healed promptly without any direct treatment. In the remaining experiments where no visceral lesions were produced, the only possible indications for laparotomy would have arisen on account of hæmorrhage; but as a careful examination did not reveal the existence of injury of any vessel of sufficient size to give rise to this indication, it is only fair to assume that patients would recover from such injuries without any special surgical treatment.

If in two out of six cases, and in four out of fourteen experiments, a bullet can traverse the abdominal cavity through from wall to wall without inflicting a mortal visceral injury, it appears certainly of the greatest importance, from a practical standpoint, to draw a line of distinction in the treatment of penetrating gunshot wounds of the abdomen with and without visceral lesions. Laparotomy should not be performed simply because a bullet has entered the abdominal cavity, but its performance should be limited to the treatment of intra-abdominal lesions which, without operative interference, would tend to destroy life.

Course of Bullet.

My clinical experience and experimental work have satisfied me that the course of the bullet determines not only the existence, but also the number of visceral wounds of the gastro-intestinal canal. It may be laid down as a rule, that the shorter the route of the bullet through the abdominal cavity, the greater the possibility that the intestines will escape injury, and the fewer the number of perforations. A bullet passing through the peritoneal cavity in an antero-posterior direction will meet with fewer intestinal loops than one that is fired through the abdomen obliquely or from side to side. The experiments related have demonstrated conclusively that bullets passing through the abdomen at points above the umbilicus are most likely to miss the intestines and to inflict simple penetrating wounds. On the other hand, bullet wounds in the upper segment of the abdomen most frequently inflict visceral injuries which require treatment by laparotomy for the arrest of dangerous hæmorrhage, as a wound of the liver, kidneys, or spleen gives rise to alarming and often fatal hæmorrhage. My experiments on dogs have taught me that the largest number of perforations are produced by bullets which pass from side to side, or obliquely through the abdomen at a point below the level of the umbilicus. A bullet passing through the abdominal cavity in an antero-posterior direction seldom causes more than four perforations, while fourteen and sixteen perforations are often found if it has passed transversely or obliquely through the abdomen at a point below the umbilicus.

The practical deductions to be drawn from the above remarks are that, if in any given case it can be shown from reliable information that a bullet has crossed the abdominal cavity in an antero-posterior direction at or above the umbilical level, the gastro-intestinal canal may have escaped injury, while if it is probable that the bullet has passed through the abdomen from side to side or obliquely at a point below the umbilicus, it is not only almost certain that it has injured the intestines, but it is almost equally certain that it has produced from three to sixteen perforations.

General Symptoms.

The general symptoms in cases of gunshot wounds of the abdomen, with the exception of those due to profuse internal hæmorrhage, furnish absolutely no reliable information in the differentiation between simple penetrating wounds and penetrating wounds complicated by visceral injuries.

Severe shock may attend even a non-penetrating wound, and it may be entirely absent in cases of multiple perforations. In one of my cases where I found twelve perforations, the patient walked a considerable distance immediately after he was shot, and was then transported on a wagon six miles to the hospital, and on his arrival he did not present a single symptom of shock or any other evidence of serious internal injuries.

Vomiting takes place as frequently in wounds of the abdominal wall and simple penetrating wounds as when the viscera have been injured.

Pallor is present in all gunshot wounds of the abdomen soon after the receipt of the injury, and it is only more pronounced when produced, at least in part, by sudden and severe internal hæmorrhage.

Pain is a very unreliable symptom, as it may be moderate or almost completely absent soon

after the injury has been inflicted, even when subsequently multiple perforations are found.

The pulse at first is slow and compressible in all cases of gunshot wounds of the abdomen, and nothing characteristic in its qualities is observed even if the stomach or intestines have been injured.

Hæmorrhage caused by wounds of any of the large vessels, mesentery, or any of the vascular organs, as the spleen, liver or kidneys, gives rise to progressive anæmia, small, rapid pulse, cold, clammy perspiration, dilated pupils, yawning, vomiting, and, in extreme cases, syncope and convulsions.

Local Symptoms.

The local symptoms are of no more value in determining the existence of visceral injuries in penetrating gunshot wounds of the abdomen than are the general symptoms just enumerated.

1. *Hæmorrhage.* — External hæmorrhage is slight or entirely wanting, unless an artery or vein in the abdominal wall has been injured. The bleeding from visceral wounds gives rise to accumulation of blood in the peritoneal cavity; this can be recognized by physical signs which denote the presence of fluid in the free abdominal cavity and by the general symptoms indicating progressive anæmia; increasing pallor of the face and visible mucous membranes, small, feeble pulse and dilated pupils. Gunshot wounds of the stomach are often followed by hæmorrhage into this organ and hæmatemesis. Hæmorrhage into the bowels from wounds of the intestines is seldom followed by bloody stools sufficiently early to be of any diagnostic value.

2. *Emphysema.*—Circumscribed emphysema in the tissues around the track of the bullet has been regarded as an important sign of the existence of intestinal perforation. This symptom is misleading and absolutely devoid of diagnostic value, as I have seen quite extensive emphysema of the subcutaneous tissues along the track of a bullet-wound of the abdominal wall where I was able to determine positively that the bullet did not penetrate the peritoneal cavity. It is very seldom present as the result of escape of gas when the stomach or intestines have been perforated.

3. *Free Tympanites.* — The accumulation of any considerable quantity of gas in the peritoneal cavity can be easily recognized by the disappearance of the normal liver dulness caused by the presence of gas between the surface of the liver and the chest-wall. This condition has been sought for in cases of perforating wounds of the abdomen and has been laid down as one of the symptoms which point to the existence of visceral wounds of the gastro-intestinal canal.

In the normal condition the quantity of gas contained in the intestines is so small that even if all of it should escape into the peritoneal cavity its presence in this locality could not be recognized by physical signs. If we remember that only a small portion of the gaseous contents of the intestinal canal will escape even if a number of perforations exist, it is evident that this symptom should not even be taken into consideration in making a diagnosis. In more than a hundred experiments on dogs I never found enough gas in the peritoneal cavity, after penetrating gunshot wounds of the abdomen, to be recognized by physical signs, and I am confident that the same holds true in gunshot wounds of the abdominal cavity in man.

4. *Escape of Fæces.*—Escape of fæces through the bullet-wound is of exceedingly rare occurrence, and is only possible when the wound has been made with a large bullet and when the visceral wound is directly opposite the internal opening in the abdominal wall. It is met with more frequently in wounds of the large than of the small intestine. When this symptom is present, it is conclusive proof of the existence of a visceral wound of the intestines and the character of the intestinal contents will furnish some indication as to what part of the bowel has been injured.

With the exception of the last mentioned symptom, there is nothing about the local or general symptoms in cases of perforating gunshot wounds of the abdomen that would enable the surgeon to decide with any degree of positiveness whether the bullet had produced any visceral injuries of the gastro-intestinal canal, and, consequently, whether laparotomy should or should not be performed.

I think every modern surgeon will agree with me in the assertion that a perforation of any portion of the gastro-intestinal canal large enough to permit the escape of the contents of the stomach or intestines into the peritoneal cavity must be considered for all practical and medico-legal purposes a mortal injury, and that its discovery furnishes a positive indication for laparotomy. In exceptional cases, where all the conditions are favorable for such a termination, a spontaneous recovery may take place by the wounded intestine or stomach forming speedy adhesions with serous surfaces, thus protecting the peritoneal cavity against infection. One of the most important conditions for such a favorable termination to take place is that the wounded organ should be empty at the time the injury is inflicted and until the peritoneal cavity has been shut off by adhesions. These cases, however, are the exception; extravasation, septic peritonitis, and death are the rule.

If a simple penetrating wound of the abdomen is an injury from which a large majority of patients recover without exposing them to the additional risks of a laparotomy, and since bullet-wounds of the gastro-intestinal canal are attended by such an enormous mortality without oper-

ative interference, the practical value and importance of a correct diagnosis before deciding upon a definite plan of treatment becomes apparent. Hence the necessity of resorting to the use of the

Hydrogen Gas Test in the Diagnosis of Perforating Gunshot Wounds of the Abdomen.

It is apparent that if some infallible diagnostic test could be applied in cases of penetrating gunshot wounds of the abdomen, which would indicate to the surgeon the presence or absence of visceral lesions of the gastro-intestinal canal, the indications for aggressive and conservative treatment would become clear.

As we can never expect by a study of clinical symptoms, or by the ordinary physical examination to fill this gap, I was induced three years ago to search for some reliable test which in such cases should prove that the penetrating bullet had injured some portion of the gastro-intestinal canal. It occurred to me that a wound in the stomach or intestine should be sought for in some such way as the plumber locates a leak in a gas-pipe. The first object to be accomplished was to prove the permeability of the entire gastro-intestinal canal to inflation of air; and the next step was to find some innocuous gas which when inflated would escape from the intestinal wound into the peritoneal cavity, and from there through the external wound, where its presence could be demonstrated by some infallible test.

Permeability of the Ileo-Cæcal Valve to Rectal Insufflation of Air or Gas.

A great deal has been said and written in reference to the permeability of the ileo-cæcal valve to injections of fluids into the rectum, or to the insufflation of air or gases. The majority of those who have studied this subject clinically or experimentally make the positive assertion that the ileo-cæcal valve is perfectly competent and effectually guards the ileum against the entrance of both fluids and gases forced into the rectum; while others insist that it is permeable only in exceptional cases, and only a few admit that its resistance can be overcome by a moderate and safe degree of pressure. I made a number of experiments on dogs to test the resistance of the ileo-cæcal valve to rectal injections of fluids, and found that the force requisite to overcome it was so great that in every experiment where I succeeded in injecting fluid into the ileum, I found multiple longitudinal lacerations of the peritoneal surfaces of the cæcum and colon. The experiments with insufflation of air and hydrogen gas proved uniformly successful, not only in causing incompetency of the ileo-cæcal valve under a pressure which never resulted in injury to any of the intestinal tunics, but in every instance I could force the air or gas from anus to mouth. Of the many experiments which I made, I will relate only one in illustration of the manner in which the experiments were made, and the results.[1]

Experiment.—"Dog, weight thirteen pounds. Animal profoundly etherized, and air forced into the rectum through short rectal tube connected by rubber tubing with inflated rubber balloon. The distended colon could be clearly mapped out by percussion before a gurgling sound in the region of the ileo-cæcal valve indicated that the air had entered the ileum. As soon as the air commenced to distend the ileum the middle of the abdomen became prominent and tympanitic. It was found that as soon as the ileo-cæcal valve had been rendered incompetent by the gradual elastic dilatation of the cæcum, less force was required in distending the remaining portion of the gastro-intestinal canal. The inflation was carried to the extent of distending the stomach, an event which was easily recognized by a considerable prominence in the epigastric region which was tympanitic on percussion. At this time an elastic tube was inserted into the stomach, and its free end immersed under water. Bubbles of air escaped freely, and the abdominal distension was materially diminished. As the inflation was continued the air escaped through the stomach tube, showing that a moving current of air existed between the rectal and stomach tube."

The same experiment was made on the human subject with similar results, showing that in the human being the ileo-cæcal valve can be rendered incompetent by rectal insufflation of air or gas with the same ease as in the lower animals. These experiments demonstrate conclusively that in the human subject by a moderate degree of force, short of producing any injury of the tunics of the intestines, air can be forced along the entire alimentary tract, and that this procedure can be employed with perfect safety for diagnostic and therapeutic purposes in all cases where the tissues of the intestinal wall have not suffered too much loss of resistance from antecedent pathological changes.

Accurate experiments to determine the force required to render the ileo-cæcal valve incompetent by insufflation of air or gas had so far not been made, and as it was exceedingly important to obtain some accurate information on this subject, a number of experiments were made on dogs and on the human subject. In all experiments air or hydrogen gas was used. The inflation was made with a rubber balloon. The pressure was estimated either with a mercury guage, or with a manometer, such as is used by gas-fitters and plumbers. The manometer or mercury gauge was connected by means of rubber tubing with the rectal tube on one side, and the rubber balloon on the other. The rubber balloon in which the hydrogen gas was collected held four gallons,

[1] Journal of the American Medical Association, June 23-30, 1888.

and numerous experiments showed that when the gas was forced through the opening of a stop-cock, the lumen of which was about the size of an ordinary knitting needle, a pressure upon the balloon equal to two hundred pounds (ninety kilograms) would never register more than three pounds (1.3 kilograms) of pressure to the square inch. The escape of air or gas from the rectum was prevented by an assistant pressing the margins of the anus against the rectal tube. I will give an account of only a few of the experiments to illustrate this part of our subject.

"*Experiment 15.*— Dog, weight thirty-five pounds (16 kilograms). Immediately after death the lower portion of the rectum was isolated and the rectal tube inserted and fixed in its place by tying a string firmly around the rectum. The abdomen was opened and the intestines left *in situ*. The ileum was cut transversely six inches above the ileo-cæcal valve and a glass tube inserted into the distal end, which was also tied in. Hydrogen gas was inflated from a rubber balloon. Under a pressure of three-quarters of a pound (.3 kilograms) the cæcum dilated, and a moment later the gas escaped from the gas tube and was ignited. The flame remained steady under a pressure of from one-half to three-quarters of a pound (.2 to .3 kilograms)."

"*Experiment 25.*—Dog, weight eighteen pounds (8 kilograms). Rectal insufflation of hydrogen gas, the dog being fully under the influence of ether. The colon and cæcum were only moderately distended when the gas under one-quarter of a pound (.1 kilogram) of pressure passed the ileo-cæcal valve with an audible gurgling sound. Under one pound (.4 kilogram) of pressure the abdomen became uniformly distended and tympanitic, and when an elastic tube was introduced into the stomach the escaping gas was ignited and burned with a steady flame as long as the pressure was continued."

"*Experiment 18.*—Strong, healthy young man. The subject was placed flat upon his back and hydrogen gas was forced into the rectum from a rubber balloon; at first the gas was forced in very slowly under a pressure of one and a half pounds (.6 kilogram) which distended the colon visibly as far as the cæcum. As the distension appeared to remain the same the pressure was increased to two pounds (.9 kilogram), when suddenly the indicator of the manometer receded to one pound (.4 kilogram), and the umbilical region became prominent and resonant, showing conclusively that the ileo-cæcal valve had been rendered incompetent and that the small intestine was rapidly filling with gas. As soon as the whole abdomen had become distended and tympanitic, the manometer again registered one and one-half pounds (.6 kilogram) of pressure and remained at this figure for some time after further inflation was discontinued by turning the stop-cock."

This and other experiments prove that in a normal condition the resistance of the ileo-cæcal valve to rectal insufflation of hydrogen gas in a healthy adult person is overcome under a pressure of one and one-half to two and one-quarter pounds (.6 to 1.1 kilograms). This amount of pressure is not sufficient to injure the coats of a healthy intestine, and none of the persons experimented on suffered much pain or any other immediate or remote consequences from the insufflation.

As the result of numerous observations, I may state that when the inflation is made slowly and continuously there is less danger of injuring the intestines than when it is made rapidly, or with interruptions. Slow and gradual distension of the cæcum is best adapted to overcome the competency of the ileo-cæcal valve, by gradually stretching the valve until the margins become separated. It is absolutely necessary to relax the abdominal muscles completely by placing the patient fully under the influence of an anæsthetic. A rubber balloon holding from two to four gallons (10 to 20 litres) recommends itself as the most efficient and the safest instrument for making rectal insufflation for therapeutic or diagnostic purposes.

Inflation of the Stomach.

It would be natural to expect that the alimentary canal could be inflated with more ease and with less force by following the direction of the normal peristaltic wave. That this is not the case was abundantly shown by the experiments which I made. These experiments demonstrated conclusively that it is more difficult to inflate the alimentary canal from above downwards, than from below upwards; as in the living animal I succeeded in only one instance in forcing hydrogen gas from mouth to anus, while in others an amount of force sufficient to rupture the peritoneal coat of the stomach, only effected distension of the stomach and upper portion of the intestinal canal. It is evident that great distension of the stomach constitutes an important factor in causing or aggravating intestinal obstruction, as it results in compression of the intra-abdominal organs, which may give rise to impermeability of the intestines, or may aggravate conditions arising from an existing partial obstruction by producing sharp flexions among the distended coils of intestine.

For diagnostic and surgical purposes the stomach can be readily inflated to almost any extent through a stomach tube, and when it becomes necessary to ascertain the presence of a visceral wound of the stomach, this method of inflation should be invariably practiced. Perforations in the posterior wall of the stomach, and in the region of the pyloric orifice, are not easily found by the ordinary methods of examination, while their existence and exact location can be de-

termined in a few seconds, and with certainty by this simple procedure.

A number of successful operations for gunshot wounds of the stomach has been reported where one bullet produced two perforations; both perforations were discovered and closed by suturing, and the patients recovered. I have knowledge of two cases where one perforation was overlooked and the patients died of peritonitis, which could be traced to the unsutured perforation. In one of these cases a bullet passed through the cardiac extremity of the stomach in an antero-posterior direction. The perforation in the anterior wall was readily found and sutured, and as no other visceral injuries could be found the operation was completed. The patient died of septic peritonitis on the second day. The necropsy revealed a second perforation in the posterior wall of the stomach, and a septic peritonitis which had plainly developed from this source, as the large opening had remained patent, establishing a free communication between the interior of the stomach and the peritoneal cavity.

The second case is reported by Dr. Ohage, of St. Paul, Minn., and is of great interest, as one bullet produced three perforations in the stomach. The bullet passed transversely through the upper part of the abdominal cavity. Abdominal section was made, and two perforations in the stomach, one near the cardiac extremity, the other near the pylorus, were easily found and sutured. The surgeon had every reason to believe that he had sutured all of the perforations. The patient died of septic peritonitis, which, as the post-mortem showed, was caused by an overlooked perforation in the small curvature of the stomach. In both of these cases it would have been easy to discover the undetected perforation, had the stomach been inflated after suturing the perforations, which were found without this diagnostic test.

Hydrogen gas being the lightest body known, non-toxic, non-irritating, and possessing valuable inhibitory antiseptic properties, is the most suitable substance for ballooning the stomach or intestines for diagnostic purposes. Pure hydrogen gas made by using pure zinc and sulphuric acid is non-toxic, and when injected into large serous cavities, as the abdominal and pleural cavities, it produces no local irritation, and is absorbed in a short time. I made a number of experiments on dogs by injecting large quantities of the pure gas into the peritoneal and pleural cavities and into the subcutaneous cellular tissue, and examination of the tissues after the absorption of the gas always showed them to be in a normal condition. Pure hydrogen gas is not only a harmless aseptic substance, but it also possesses at least indirect antiseptic properties. The only pathogenic microbe which is known to be capable of reproducing itself upon a proper nutrient medium in an atmosphere of hydrogen gas is the bacillus tetani; most pathogenic microbes require a certain amount of oxygen for their growth and reproduction besides the nutrient medium.

Inflation of the peritoneal cavity with hydrogen gas, may prove to be one of the means of preventing septic peritonitis in cases in which the hydrogen gas test is applied in the treatment of gunshot wounds of the stomach and intestines. There is absolutely no danger of causing an explosion in lighting the gas as it escapes from a perforation in the abdominal wall or from the end of a small glass tube. The smallness of the openings in the instances just cited will be a sufficient safeguard against an explosion. As a matter of course, ignition of a large volume of hydrogen gas should be carefully avoided, as such an occurrence would cause an explosion.

(*To be continued.*)

THE HISTORY OF MICROBIAN PRODUCTS WHICH FAVOR INFECTION.[1]

BY PROFESSOR CHARLES BOUCHARD,
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[Translated for THE JOURNAL.]

1. It is not uncommon to see two different species of microbe invade at the same time an animal organism; the result of this mixed infection may be widely dissimilar. Sometimes the two pathogenic agents develop side by side, without any reciprocal influence upon each other; sometimes the animal will find in one of them an unexpected ally against the other, when it would have succumbed to the one affection, it survives the combined attack of the two; finally the two microbes acting together sometimes overcome an organism which would have resisted successfully either one of the invaders, if attacking alone. It is this last group which is reviewed by the *Gazette*. The writer remarks that it is the result most frequently seen; almost always infection intensifies infection.

It is not necessary that the two microbes both be pathogenic in order that their results become virulent; one of them may be a simple saprophyte. It sometimes happens in fact that two forms neither of which are pathogenic to the animal produce, when associated, death. This has been demonstrated by experiments upon what has been called symptomatic anthrax. The product of this microbe, so virulent for the bovine species, is without action upon the rabbit; inoculation of this animal, either under the skin or into the muscles, produces with this bacillus no result.

Let us now take another microbe, inoffensive of itself, the bacillus prodigiosus, and mingling it with the microbe of charbon symptomatique,

[1] Gazette Hebdomadaire, July, 1890.

inject it into the tissue or under the skin; the animal dies and we find at the point of injection a tumor with all the characteristics of anthrax. We here find two microbes, neither of which are pathogenic for the rabbit when injected alone, but which taken together give to one of them a quality which, in relation to this animal, it had not before. The action of the auxiliary microbe, in this case the bacillus prodigiosus, depends upon the matters secreted. The result is the same whether we employ the living cultures, the sterilized cultures or simply the glycerole of the cultures, that is what has been called the extract.

This power of one microbe to modify the qualities of another does not belong especially to the bacillus prodigiosus; other forms possess analogous properties. This fact has been established by experiment, by injecting the soluble matters of the staphylococcus aureus, of the proteus vulgaris or of sterilized extracts of putrefying flesh. The facts which have just been stated seem to have a general application as may be demonstrated by experiments with a large number of different forms. For instance, Flugge and Vossokovitch have shown that certain soluble products render possible the development in the organism of microbes non-pathogenic. Grawitz and Bary have found that the inoculation of the staphylococcus aureus with the secretions of bacillus prodigiosus intensifies the pus-producing power of the former. Recently Monti has rendered virulent the attenuated cultures of the pneumococcus and streptococcus by injecting at the same time the secretions of other microbian forms, and especially of the proteus vulgaris.

These soluble matters which favor infection do not act by altering locally the tissues into which they are introduced; their action is general upon the whole organism. In fact the better method where we wish to diminish or abolish the resistence of an animal to invasion, is to inject the soluble products directly into the blood. In this way we obtain the effect with doses twenty or thirty times less, and much more rapidly than when the injection is made at point of inoculation.

The experimental facts here noted agree perfectly with the results furnished by clinical study. Soluble substances similar to those secreted by the microbes under cultivation are constantly produced in the alimentary canal. M. Bouchard, who has studied with so much care the auto-intoxications dependent upon gastro-intestinal putrefactions, has demonstrated that the putrid poisons absorbed by the portal vein favor a great number of infectious inflammations and render these diseases more likely to terminate in suppuration. They, the soluble matters, as distinguished from the forms, when taken into the system produce a culture medium, so to speak, favorable for the development of pyogenic bacteria, and especially of the staphylococcus aureus. It would seem, therefore, that the most efficient method of combating the infections from this microbe, consists in diminishing the intestinal putrefactions. This scientific deduction is in harmony with the well-known clinical fact that one of the best known forms of treatment for this class of troubles, is by the use of the insoluble antiseptics. By this means M. Bouchard has succeeded in arresting promptly the most intense and the most obstinate forms of furuncular disease.

2. If an animal be inoculated with the secretions of certain microbes, as for instance the bacillus pyocyaneus or of symptomatic anthrax, and if several days afterwards the same animal be inoculated with the living microbe, the previous inoculation having been sterilized, there will be no infection, the animal survives, it has acquired an immunity, in other words it has been vaccinated.

If instead of allowing several days to elapse between the time of the introduction of the secretions of the microbe and the living bacterium, the two are introduced at the same time, the animal succumbs, in fact death is produced more surely and more rapidly than if the inoculation is made with the living microbe alone. It thus appears that bacterian products have two diametrically opposite effects depending upon the time of their introduction as related to the inoculation of the pathogenic form.

This conclusion clearly follows from the experiments conducted by Bouchard with the bacillus pyocyaneus. He says, "I had thought that immunity would be obtained more quickly by injecting *en bloc* the vaccinating matters at the beginning of the malady, than by waiting for this immunity to result from the gradual development of the pathogenic agent. I had imagined that in this manner one would be able to diminish the duration of the disease, and possibly find in these products of bacteria a remedy for the infection itself. Experience has not justified this conjecture. The chemical matters produced by the bacillus pyocyaneus, which cut short, or prevent the disease when injected a few days or a few weeks before the inoculation of the bacillus itself, if injected at the same time as the living form, that is along with it or nearly at the same time, instead of diminishing the intensity of the infection increases it and hastens the death of the animal."

The result is similar with symptomatic anthrax. The matters secreted by the microbe of this disease confer immunity against inoculation practiced several days afterwards. If introduced into the system at the same time as the microbe, they favor the infection, and even render this bacterium pathogenic to animals ordinarily refractory, as for instance, the rabbit. Considerable quantities of the soluble matters secreted by this

microbe injected into the veins of the rabbit produce no harm; inoculation of the animal with the living microbe is followed by no morbid symptoms. If the injection of the secretions into the veins and of the living microbe into the muscles be practiced at the same time, the animal dies in from twenty-four to forty-eight hours with an enormous tumor, in fact of anthrax.

This fact enables us to understand how it happens that the inoculation of symptomatic anthrax, in the case of the rabbit into the anterior chamber of the eye, and at the same time into the leg results in the formation of a gangrenous tumor in the leg. Even in this animal the anterior chamber furnishes a culture medium for this bacillus; the development of the microbe in the anterior chamber results in the formation of the soluble products which, absorbed into the blood, renders the inoculation into the muscles virulent. In other words the resistance is abolished.

In relation to the facts just stated it is interesting to compare the results obtained by M. Courmont. In carrying out his experiments upon tuberculosis in the cow, he found that the injection of the secretions of the microbe into the tissues in advance of an inoculation with the living bacilli, instead of producing immunity, increased the susceptibility of the animal to the disease. The absorption of these matters or their introduction produced a permanent predisposition.

These facts are almost exactly the opposite of those reported by M. Bouchard. In the case of the bacillus pyocyaneus and of symptomatic charbon the introduction of the soluble matters secreted by these microbes produce immunity; in the case of the tubercular bacillus on the other hand, the introduction of the products of the microbe produces a permanently increased liability to tuberculosis.

3. If it is true experimentally that microbian products favor infection by modifying the general condition of the animal, we ought to be able to find out the nature of this modification. The experiments looking towards the solution of this problem constitute the most curious and interesting portions of the memoir of M. Bouchard. He commences by demonstrating, first, that the soluble products do not favor infection by so changing the quality of the tissues or fluids as to present to the attenuated microbe a culture medium in which it regains its virulence.

Attenuated pneumococcus or streptococcus introduced into sterilized broth of putrefying flesh readily develop, but do not regain their pathogenic qualities. A second hypothesis is suggested, namely, that the soluble matters, that is the secretions, are poisonous to the animal, and therefore diminish its resistance to the infection. "In order that this toxic effect may be produced, notable quantities of the bacterian poison must be introduced," says the author. He continues, "In a majority of my experiments the quantity introduced was too small to produce any appreciable effect upon the general condition of the animal. In the experiments of Roger, there was no intoxication from the injection of the products of the bacillus prodigiosus, though it intensified the effects of the bacillus of symptomatic anthrax; in the rabbit there is in fact no infection, the animal possessing a natural immunity. Poisoning by bacterial products then do not complicate infection, but infection is rendered possible or intensified by the presence of these substances in consequence of some influence which they exert over the processes by which the organism defends itself ordinarily from microbic invasion.

As has been noted in a former number of the *Gazette*, it is probable, that immunity is the result of multiple conditions; we know, however, with any degree of precision of only two modes of resistance to infection, namely, phagocytosis, and a chemical alteration of the secretions, so that they resist the action of the microbes or destroy them. Experience seems to show that the presence of these products of bacteria do not modify the quality of the blood by which it destroys microbes; at least in animals vaccinated. There remains only the other hypothesis, that is that these products which favor infection do so by arresting the diapedesis, or migration of white corpuscles, and consequently preventing phagocytosis or the envelopment and digestion of the invading agent. Experiments bearing upon this last proposition were conducted as follows: He introduced under the skin of an animal the microbe to be studied enclosed in a small cell between two plates of glass. Of two animals operated upon one is reserved for comparison; the other is now subjected to the inoculation of the secretions of bacteria under the skin or into the veins. In the course of three or four hours the glass preparations are withdrawn and examined with the microscope, the number of migratory cells, the number of the microbes enclosed in them, and the number of free microbes in the two cells are compared. The results of these experiments have been extremely definite. The soluble products have arrested diapedesis, and their action has been especially marked when injected into the veins. It will be remembered that this mode of introducing the secretions of microbes had already been found to have the most prompt and certain effect in intensifying infection. If for instance we place under the skin of a rabbit a few drops of a culture of the bacillus pyocyaneus contained in a cellule, such as above indicated, we shall find in the course of three or four hours that there has taken place a very active migration of the leucocytes, and that the destruction of the bacilli is rapidly progressing. But if, repeating the same experiment, we inject simultaneously into the vein ten cubic centimetres of the

soluble products of the same microbe the diapedesis is not produced, there will be found here and there only a few leucocytes. The results are similar with the bacillus of anthrax and with the staphylococcus aureus; the sortie of the leucocytes which these microbes normally stimulates, is prevented by the introduction of the microbian secretions effected in artificial cultures. We have here the results reached when an animal is inoculated with the living form, and at the same time receives into the veins the formless product, in other words the secretion of the same bacterium. We have also seen that the soluble matters of one microbe introduced into the system favors infection by another form. M. Bouchard has demonstrated that the secretions of one species are capable of arresting or preventing the diapedesis which another species tends to excite. The soluble products of the bacillus pyocyaneus, for instance, prevents the leucocytes from attacking the bacillus subtilis, the attenuated bacillus of anthrax in the rabbit, the virulent anthrax in the dog, etc. In all these procedures there had been previous experiments with water, and with simple bouillion, and it becomes therefore certain that the results were dependent upon the relation of the living forms and the non-living product. In pursuing still further these experimental researches, we are able to gain some information as to the mechanism, by which the unformed products of microbes prevent the migration of leucocytes.

Diapedesis is in relation to the state of the blood-vessels; it is very active when the arteries are dilated; it is diminished or arrested when the arteries are contracted. It has been demonstrated during studies upon the streptococcus of erysipelas that section of portions of the sympathetic which are distributed to the point of inoculation, notably increases the migration of leucocytes at the seat of the operation. Cellules, such as described above, were placed under the skin of each ear; on one side the superior cervical ganglion was destroyed; at the end of four hours, it was found that the leucocytes upon the side from which the nerve had been removed were very much more numerous, in fact thirty to forty times more numerous than upon the side having the nerve intact. Vascular constriction has an effect exactly the reverse, diminishing diapedesis, and it is by producing this vascular constriction that the soluble products of microbes prevent the migration of the round cells and consequently diminish the resistance of the animal to infection. The invaders are allowed to develop, while the besieged are prevented from making a sortie for the purpose of the destruction of the enemy.

MM. Charrin and Gamalëia have made some curious experiments bearing upon this problem. By rubbing the ear of two rabbits with croton oil, and then injecting into one of them the soluble products of the bacillus pyocyaneus, a marked difference was observed in the two animals; in the one not treated with the microbian product there were the usual results of the agent, vascular dilatation and dermatitis with swelling; the other, treated with the bacterian secretion, maintained its normal appearance and condition.

This action of microbian products is transient; at the end of a few hours elimination has been accomplished and the vessels again readily dilate. In this case the morbid predisposition is of short duration; if a certain time elapses between the introduction of the solution and the inoculation with the living microbe, twenty-four hours for instance, it will be found that the resistance of the animal has been restored to its normal condition. In view of these facts it is pertinent to ask, how does the injection of the solution favor the infection? If the elimination is accomplished in so short a time, diapedesis ought to take place and the bacteria should be destroyed. It may be said in answer, that while the soluble matters hold in check the migration of the leucocytes the microbe has had time to develop and to produce its own secretions, so that when the elimination of the introduced product has been accomplished, the contraction of the vessels is maintained by the new secretions formed in the tissues or fluids, while the living form continues the work of invasion and destruction.

It is easy to understand how complex fluids such as those used in these experiments, may produce quite different effects. Matters which favor infection act promptly but are only transient, elimination rapidly taking place; substances which give immunity require a considerable time to produce their effects, but accomplish a permanent modification of the fluids or tissues. These new facts, established by the experiments of M. Bouchard, serve to explain many obscure points in the history of infectious diseases.

The soluble matters of which the effects have been so thoroughly studied by the experimenter, commence to be formed as soon as the microbe begins to develop; they are necessarily related to its normal vegetation. If these matters do not possess the property of contracting the vessels, diapedesis will take place, the leucocytes will come to devour the invading agent, and in this manner prevent general infection. If the substances secreted on the other hand do produce contraction of the walls of the vessels, the escape of leucocytes is prevented, the microbes develop, multiply and are disseminated; they are pathogenic precisely because they produce a secretion which has this action upon the blood-vessels, in other words a poison to vascular walls.

It would appear that natural immunity must result, in part at least, from the fact that the blood-vessels of the refractory animal are not responsive to the microbian products, that in the

presence of these substances the vessels retain their normal properties and diapedesis in the presence of living bacteria takes place, and consequently the destruction of the invader is accomplished. Is the process the same in the case of acquired immunity, that is to say, the resistance conferred by vaccination?

In endeavoring to answer this question we find a new element. Introduced into an organism modified by vaccination, the bacterium does not develop well; the blood and tissues do not furnish a good culture medium; or perhaps we should say the blood and tissues of a vaccinated subject are themselves destructive to bacteria. As a result, there is produced by the invading microbe only a minimum quantity of soluble products, and it is unable to protect itself from the army of migratory cells. These come to attack a form already enfeebled by a bad soil and unhealthy surroundings, and as a result the foreign agent is easily overcome and destroyed. The animal resists infection, not because the bacterian products have not the power to act upon the vessels, but because the infecting form is not able to produce its normal quantity of these products.

We have here briefly analyzed the experiments of M. Bouchard, which furnish, in part at least, an explanation of the phenomena of susceptibility—of natural immunity—and of acquired immunity, that is by vaccination. Without doubt, there is much yet to be done before these complicated and difficult problems shall be entirely solved; problems which up to the time of these studies seemed to defy all explanation. Is it not very much to have revealed to us in part the mechanism of these processes, and by positive and well-established facts, to have established a general law which accords so well with clinical observations and the results of experiments?

MEDICAL PROGRESS.

INTESTINAL ANTISEPSIS.—(*Wiener medizin. Presse*, May 25, 1890.) To render innocuous the pathogenic organisms of the intestines, attempts have been made with drugs administered by the mouth or rectum. By the first method only those remedies are indicated that will pass through the stomach unchanged. Calomel is an agent of this class, but while serviceable in simple fermentative conditions, it is impracticable in infection of long duration. BOUCHARD used large quantities (100 grams daily) of pulverized carbon in typhoid fever; naphthalin, iodoform and salicylate of bismuth have also been recommended. These agents possess a certain antiseptic influence on the contents of the alimentary canal, but on the intestinal wall their action is *nil*, which fact receives confirmation in the treatment of typhoid fever. The intestinal antiseptics require heroic administration, and aside from toxicity, they are absorbed in the stomach and altered in their chemical constitution before attaining the desired site. For this reason CANTANI considers their exhibition *per rectum* as the proper method. Repeated experimental investigations show that intestinal irrigations may pass the valve of Bauhin, and reach the upper part of the small intestines. The advantages arising from rectal injections are: the use of large doses, direct action and the avoidance of gastric irritation. There are also other advantages attending this method. The use of cold water reduces the temperature; whereas hot water is of benefit in cholera. Thorough lavage of the intestines is also attained and a certain quantity of bacteria and ptomaines are mechanically removed. Cantani considers carbolic acid and tannic acid to be the best intestinal antiseptics. Corrosive sublimate exerts no antiseptic action, owing to its union with albumen. Tannic acid fulfils a double indication for rational intestinal antisepsis; it paralyzes the vegetative activity of the bacteria and renders the ptomaines innocuous. The value of tannic acid in effecting the objects already mentioned has received abundant clinical proof in the treatment of intestinal catarrh accompanied with fermentation and true specific dysentery. If the injections of tannic acid prove too irritating, then the addition to the injection of about 1 litre of oil is of advantage. In typhoid fever these injections are of great value; meteorism and diarrhœa disappear and the entire course of the disease is favorably influenced. In the incipiency of this disease, it is possible by injections of tannic acid, to abort it. Cantani has also secured an abortive action in the beginning of typhoid with injections containing 1 gram of the hydrochlorate of quinine, and from 10 to 50 grams of pure carbolic acid in two litres of cold water.—*Occidental Medical Times.*

INDUCTION OF PREMATURE LABOR.—In these days when abdominal section is so freely practiced obstetricians of authority tend to throw discredit upon the induction of premature labor and craniotomy, and so advocate Cæsarean section. PROF. AHLFELD, however, has lately issued an important monograph on 118 cases of induction of labor, performed by himself and his assistants between 1871 and 1890, at Leipzig, Glessen, and Marburg. In 111 of these cases labor was induced on account of deformed pelvis, in the remaining 7 it was undertaken because of some general illness. Only one mother appears to have died from the direct results of the proceeding in question, she succumbed to damage of the soft parts caused by the passage of a large head

through an atypical pelvis. Four mothers died from diseases which either followed accidentally or were those for which labor had been induced (convulsions, tuberculosis, heart disease), 75 mothers recovered without rise of temperature. One hundred and twenty-one children were thus delivered (there being three cases of twins in the 118 labors). Of these 19 were stillborn, 18 died in the course of the first day, 9 died before the mother was discharged, and 75 left the hospital, etc., alive. Out of 99 carefully registered contracted pelvis cases (including 2 twin labors) 86 children were born alive, 15 stillborn, and 61 survived. On the other hand, in 6 cases of Cæsarean section performed in Professor Ahlfeld's wards, 2 mothers and 1 child died. Space forbids any notice of the author's statistics as to the extent of contraction in the pelves. The monograph deserves close study. Professor Ahlfeld insists that the introduction of a flexible bougie into the uterus without rupture of the membranes is by far the best method, but the pains are apt to be slow, so that accessory means are sometimes required. There can be no doubt that the majority of practical obstetricians are more likely to attain good results by inducing labor than by performing Cæsarean section or Porro's operation.—*British Medical Journal.*

ALBUMINURIA IN PREGNANCY AND LABOR.—LEOPOLD MEYER (*Zeitsch. f, Geb. u. Gynäk.*, xvi, 2) examined the urine of 1,127 pregnant women in the pursuit of this study, and of 1,138 women in labor. The urine examined was in all cases removed by the catheter. The test for albumen was by means of boiling and the addition of nitric acid. Quantitative analysis was not made. In all cases where even a trace of albumen was obtained, the urine was placed in a cone-shaped vessel and the sediment examined by the microscope.

Albuminuria in Pregnancy.—Albumen and albuminuria comprise many things. We should keep in view serumalbuminuria, globulinuria, peptonuria, hemi-albuminuria, etc., but to the clinician this differentiation is not feasible. The latter must call in aid the microscope, and the greatest weight is to be attached to the presence of urinary casts. Where the latter exist, the strong probability is that the albuminuria is of renal origin, which is to be separated from the other form of albuminuria, which, in a large number of cases, is evidently not renal. The presence of the so-called renal epithelial cells is of great moment. Of the 1,127 pregnant women whose urine was examined, the latter was found free from albumen in 93.3 per cent.; it contained "doubtful" albumen without casts in 1 per cent.; albumen without casts, 3.2 per cent.; albumen with "doubtful" casts, 0.3 per cent.; albumen with casts, 1.9 per cent.; together with two cases, subjects of gonorrhœa, which showed albumen without casts, and one case with renal fistula, which showed albumen and casts. Deducting the last three, albumen was found beyond doubt in sixty-one cases, or 5.4 per cent. These figures, for themselves, are of little interest; the important thing is to investigate the conditions which dispose to albuminuria, and its significance for mother and fœtus. As regards the former, little is to be learned from material gathered in hospitals, the modes of life of the patients and their surroundings not being accessible to interpretation. As regards the symptoms during pregnancy, albuminuria without casts very seldom shows any symptoms. When they exist, they generally depend upon cystitis or pyelitis. Albuminuria with casts in general also shows no symptoms.

Albuminuria during Labor.—The author investigated the urine of 1,138 non-selected cases, and found urine without albumen in 75 per cent., with albumen in 25 per cent. The albuminuria may increase during the progress of labor, or may be absent at one time, to appear later on. The albuminuria found during labor unquestionably begins during the parturient act.

Course of Albuminuria during Pregnancy and Labor.—The rapid disappearance of albuminuria—as well as that accompanied by eclampsia—on the cessation of labor, led to an unusually favorable prognosis for the affection; later investigations indicated a certain reservation, as it was found that the trouble was prone to become chronic. From his researches the author concludes that the albuminuria without casts appearing during labor rapidly disappears on its termination. It is possible that these patients have an exaggerated disposition to catheter cystitis, and especially those in whom albuminuria existed during pregnancy; in these also the affection may terminate spontaneously, but disappears more slowly than in the first-mentioned cases, and sometimes persists for some time. The more considerable the albuminuria during labor, the longer time was required for its subsidence; but the period of recovery is not dependent upon the quantity of the casts. As regards the termination of cases of albuminuria with casts observed during pregnancy, the percentage of uncured was a large one. The prognosis in this affection must be regarded as very doubtful as regards recovery; albuminuria with casts appearing during labor, in most cases terminates after birth, generally four days post-partum; a small proportion remains uncured.

The Relationship between Albuminuria and the Vitality of the Fœtus, and the Alterations in the Placenta.—In women with albuminuria relatively more frequent premature labors took place, showing especially in cases in which the quantity of the albuminuria was considerable; but the observa-

tions of the author show no particular causative effects in albuminuria as regards the death of the fœtus. The alterations in the placenta in general comprise a premature separation of the organ, with the appearance of so-called white infarcts, which have been associated with the renal affection in the mother. Of the 1,344 placentæ investigated, white infarcts as well as evidences of premature separation were found in but twenty-six. While it is evident that a certain relationship exists between renal affections and changes in the placenta, it is not of such indubitable and conspicuous a character as is claimed by some.—*Am. Jour. of Obstetrics.*

THE BACTERICIDE EFFECTS OF BLOOD.—PROF. Y. FODER, who has been carrying on a number of experiments on the bactericide effect of blood, reports some of his results. He finds that the bacilli of anthrax survive in larger numbers in defibrinated arterial than in venous blood, and in fresh blood more than that which had been exposed to the air for several hours. Blood allowed to stand for 16 hours showed no bactericide effect at all. On one occasion freezing did not affect this property, but on several others it destroyed it; as also happened when it had been warmed to 50°C., though a lower temperature (38° to 40°C.) increased the bactericide properties. Prof. Foder also examined the effect of various drugs, injected into the stomach, upon the bactericide properties of the circulating blood. Dilute hydrochloric acid, tartaric acid (3 to 5 gm.) lactate of quinine (0.6 to 1 gm.) diminished these properties, while muriate of sodium (3 to 5 gm.) rather augmented it. Alkalies invariably increased it. The decrease in the number of the anthrax bacilli inoculated into the blood was as follows: Carbonate of ammonia (from 2 to 5 gm.): before the injection, 27 per cent.; after the injection 38 per cent. Phosphate of sodium (from 2 to 5 gm.): before the injection, 32 per cent.; after the injection, 60 per cent. Carbonate of sodium (from 2 to 5 gm.): before the injection, 23 per cent.; after the injection, 76 per cent. Carbonate of potassium (from 2 to 5 gm.): before the injection, 48 per cent.; after the injection, 77 per cent. Carbonate of sodium from 2 to 5 gm.): before the injection, 29 per cent.; after the injection, 83 per cent. He injected into the stomachs of rabbits, subcutaneously, from 1 to 5 gm. of bicarbonate of sodium, and made, either simultaneously or after from 5 to 24 hours, inoculations with anthrax. The control rabbits which had not been protected by the sodium salt, succumbed, and numerous bacilli were found in the blood and in the spleen. Out of 19 rabbits protected, 3 (15.6 per cent.) died. 9 (47 per cent.) of the rabbits died, and no bacilli, or a very small number of the bacilli, were found in the blood; these rabbits, however, survived the experiments for a considerable time. 7 animals (37 per cent.) resisted infection, and this was also occasionally observed in subsequent experiments. Dr. S. Gerlóczy had been induced by these experiments to try the bicarbonate of sodium in typhoid at the Rochus Hospital, and had observed a favorable influence from it. Dr. O. Petrick alluded to the difficulty of counting the bacteria in the blood after inoculations; and to the fact that in estimating a decrease or increase, it should be remembered that many of the bacteria were retained in the capillaries of the liver and spleen, and in the marrow of the bones, being, in fact, filtered out. Ponfick had stated that the white corpuscles of the spleen were able to take up granules of cinnabar, and that these became localized; but the granules could also be found in the capillaries of the marrow after extirpation of the spleen. Similar conditions were observed in the pigment granules in the blood in cases of intermittent fever, which disappeared after the attack. Prof. Arenstein also stated that he had found them in great numbers, after death, in the capillaries of the liver and spleen, and in the marrow. Dr. Y. Donath said that the bactericide property of the organism was a medical postulate, when we considered how many bacteria entered the body through the lungs, or the surfaces of wounds. Prof. Foder deserved credit for demonstrating that this effect was to be ascribed to the influence of the blood. He did not think that this was due to the alkalies, but rather to the increased power of oxidation that they produced. Thus we knew that albuminoid bodies are more readily oxidized by ozone in an alkaline solution. Under the title of disinfectant, in its widest sense, we understand a remedy capable of killing microbes, though these remedies might differ widely in their chemical constitution. A drug, as common salt, might be inert in a diluted state, and most active when concentrated. Prof. Foder's experience supported the theory that the oxygen of the blood had a bactericide effect, as he had found that arterial was much more active than venous blood.—*Vienna Cor., Occidental Medical Times.*

VOMITING OF PREGNANCY.—When this symptom proves absolutely intractable, and it reaches such a degree as to endanger the life of the patient, PUGLIATTI (*Morgagni, 1889*) recommends the induction of abortion. For this purpose he advises the introduction of bougies having a thickness 6–10 mm., extending 5 or 6 cm. into the cavity of the uterus. After 2 or 5 hours another and somewhat larger (2–3 mm.) bougie is inserted, this is followed by a third, which is allowed to remain several hours or until distinct contractions of the uterus are observed. The author claims that this method is free from danger, and with it the fœtal membranes are preserved.

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SATURDAY, AUGUST 30, 1890.

DISCUSSION ON HYPNOTISM.

At the late meeting of the British Medical Association this subject attracted unusual attention in the Section of Psychological Medicine. DR. NORMAN KERR read a paper entitled, "Should Hypnotism have a recognized place in Therapeutics?" He fully accepted all the hypnotic phenomena as facts, but in hypnosis he recognized only disordered cerebral states, and abnormal psychical conditions, with exaltation of receptivity and energy.

He denied that it had any therapeutic value, claiming that the after effect was a disturbance of mental balance, a dissipation of nerve energy and nerve exhaustion. Frequent repetition was apt to cause deterioration of brain and nerve function, intellectual decadence and moral perversion. Hypnosis was a departure from health and a diseased state. It was also a true neurosis, embracing the lethargic, cataleptic, and somnambulistic states. Thus, if a disease was cured by hypnotism, this would be only by substituting another disease. Though suffering is often temporarily lessened by hypnotic suggestion, the underlying disease was not necessarily cured. Any one may obtain relief from pain by becoming drunk, but this respite is dearly bought, as drunkenness always aggravated the diseased condition. By hypnotic anæsthesia, though evanescent oblivion might be secured, the lethal power of the morbid disorder, of which the pain was a merciful if unwelcome messenger, was in most cases increased. The alleged benefits from hypnotism were claimed to be cures of all forms of nerve disorders. Dr. Kerr believed that all such cases were intensified by this remedy. He urged that this therapeutic measure was dangerous, and should not be employed in any way. That it always favored states of mental unsoundness, and tendencies to develop morbid nervous susceptibilities, and unstable brains, which in these days of nerve exhaustion was especially dangerous.

DR. KINGSBURY replied to Dr. Kerr's attack on hypnotism, and asserted that no remedy of modern times promised so much in the treatment of nerve disease. He gave many instances of the relief of insomnia, neuralgia, and other diseases, and final cure by the hypnotic suggestions, and declared in the face of the facts (which were beyond all dispute), it was folly to condemn this remedy. In the discussion several prominent alienists expressed themselves guardedly, but in favor of a more careful study and experiment with hypnotism.

Dr. Kerr's paper has been freely discussed, and evidently is supported by many of the leading medical authorities. On the other hand, the *French school* of investigators, including DRS. CHARCOT, LUYS, and the *Nancy school* of medical teachers, and many very able students of mental disease, declare that with hypnotism it is possible to relieve and cure a great many of the neurotic diseases that are now considered incurable. It is evident that the phenomenon of hypnotism has passed beyond the region of quackery, and is now a matter of medical and scientific investigation. Already there are three or four works published, describing what is known up to the present, of hypnotism and its value in medicine. In a late number of the English *Fortnightly Review*, Dr. Luys, a distinguished authority, describes at some length a series of hypnotic phenomena of the most marvelous character. The impression on the reader is that if this is real and practical, we may expect from hypnotism the most valuable remedy and therapeutic measure, that has been found in the century.

While Dr. Kerr's protest and warning against the use of hypnotism is timely, and will do good in checking the contagious enthusiasm of many, still there is a range of facts, and a possibility of practical application, that cannot be ignored or put aside as unworthy of study.

It would appear that the American physician might find a fertile field for the practical study of

hypnotism in the rush and revolution of events that so profoundly impress the brain and nervous system, in this country. We commend this new field of investigation to our readers, assuring them that some of the most acute medical students of the world have taken up this topic, and an almost boundless realm of possibilities, bearing on the power of the mind over the body, appear in the medical horizon in this direction.

THE PARAMOUNT QUESTION.

The subject of preliminary education preparatory to the study of medicine holds a prominent place in the thoughts of the profession, at the present hour, both in this country and in Europe. It is not the question of its importance, for that hardly admits of argument, but rather as to what the accepted standard of requirements shall be. So too, in our medical colleges there is a general demand for lengthened terms of study, and for more critical examinations. This is well, and the fact needs no restatement, that every diploma should carry with it the guarantee of thorough preliminary and medical training. But it seems to us that another and a paramount question lies beyond these: the question that relates to the after-training of the man who has received his degree and entered upon his professional career. Coming to the fulfilment of a sacred obligation he is bound to render to his patient the most perfect service of which he is capable; a service which justice and humanity alike demand. The fulfilment of this obligation is partly conditioned upon his previous training, but more and more as the years go on, it depends upon his *after-development*. And here is the signal danger: that men, especially if not impelled by the stimulus of necessity, will lapse from active exertion, and rest more and more contented, with imperfect methods of observation, and spend the best of their years in a sort of rutty, routine practice. Humanity has claims upon our profession for better service than such men are apt to render, and the agency that may lift them from such low estate would be its greatest benefaction. Some men are a stimulus unto themselves; they grow in knowledge and in wisdom as they grow in years, until their attainments become their crowning glory. Unfortunately for the sick man and for a noble profession such men are exceptional.

At this juncture the added stimulus that most men seem to need is that of friction, mind with mind. They need to measure themselves with other men, and thus to discover their own strong points and their weaknesses as well, and herein lies the value of the medical organization which, as best it may, shall supplement the college work. Such organizations have been exceedingly helpful in the past, and they will be in the future. In most instances they are sustained by the personal efforts of the few, and have within them the element of instability.

What we seem to need now as much as we need medical colleges, is, a perfected plan of medical organization which shall be acceptable to the members of the profession—which shall command their allegiance, and which shall be to them in turn an inspiration to *continuous* work. Such development cannot be the work of a day, nor of a year—it must be one of time, and it should bear the impress of our wisest counsellors. With this purpose in view, at the meeting in Nashville the Editor of the *Lancet-Clinic* offered a resolution that a committee of nine be appointed to report upon the propriety of modifying the present working plans of the Association. We think the resolution was timely and its purpose wise. A well-selected committee can render a valuable service by submitting a carefully prepared report which shall cover the whole ground, advising as to whether our present plans are best, or whether others would serve us better.

It would surely be presumption on our part to forestall the work of that committee; but it does seem evident that a representative plan by which delegates of local societies shall constitute State organizations, and that the representatives of these shall form the executive body of a National Medical Union, would furnish an enduring basis for a permanent National organization. Every member of every local organization could thus be a member of the National Association, and be there represented.

It was this representative feature, so in accord with the genius of American institutions, which led us to refer in a recent article to the constitution of the Medical Society of the State of New York.

In making that allusion, it is hardly necessary

to say that we simply had reference to the working plan of that society. The question of code, ethics or affiliation was not in our mind. We neither intended to bestow a passing compliment nor by implication to pass censure upon the State Association—now, perhaps, the most vigorous and successful organization in this country;—and of itself so strong that it can be alike indifferent to either praise or criticism. What we desire is this—to ensure for every legitimate medical practitioner a local medical home, where with his fellows he may do his best work; that the representative men of these homes shall constitute strong State societies, and that in the union of all our State societies we may develop a National medical association which may number a membership from twenty thousands upwards, including each member of every local organization. Let the annual fee for membership be placed at five dollars: one for the local society, one for the State—and three for the National organization——the latter amount to be a subscription for THE JOURNAL. Then will the purpose of the Resolution offered at Nashville by Dr. Comegys, of Ohio, be fulfilled, and THE JOURNAL find its place at the fireside of every appreciative physician in the land.

DISEASES OF BRITISH COLUMBIA.

A letter to the *British Medical Journal* from British Columbia throws some light upon the diseases of the Indians in that remote region. Speaking first of the theory that leprosy has its origin in a fish-diet, the writer avers that this disease is wholly unknown in that province, although the chief food of its natives is of fish, all the year 'round. The fish that are prepared for winter consumption are roughly and incompletely cured, and become highly disagreeable in odor, partially decayed, in fact, in many cases. If fish-food can produce leprosy the Indians of the Fraser River country should be decimated by that disease. Salmon die by the thousands in that river, and along its tributaries, and they are freely eaten, both dead and dying, even when the river itself is tainted with odor of decaying fish. Malarial fever is unknown in that country, although governed by many of the conditions that seem to make it prevalent in other parts of the globe. The low-lying lands along the numerous rivers are periodically flooded and saturated by the down-flow of water from the melting of snow in the three great mountain ranges. Meadows and prairies are converted into lakes, and while the floods are subsiding, and afterwards, thick mists arise, morning and evening, for months. And yet these regions are not regarded as being unhealthful or malarious. Another scourge of mankind, hydrophobia, has not reached that distant point. If a superabundance of ownerless, wild and neglected dogs could produce rabies that province should suffer acutely. The camps of the Indians are well-nigh surrounded by wretched, half-starved and mongrel canines; and in Vancouver the plague of ownerless dogs was so great that active measures had to be put in force for their destruction. Diphtheria, however, has found its way into that beautiful country, across the barrier of the Rockies, and rages with virulence among the young. Doubtless the first case was imported; and it would so be found if due inquiries were to be made. Once imported, the absence of drainage has enabled the disease to flourish and become endemic. The epidemic of influenza, which last winter visited the Pacific coast, extended into the interior also, and produced sickness and many deaths among the tribes in the heart of the country. Superstition and witchcraft had full sway among the ignorant natives in their efforts to drive out the demoniac causes of their strange visitation, and in the case of one of the tribes, a little boy of 7 years, the nephew of the chief of that tribe was fixed upon by the medicine-man as the responsible cause for the epidemic and its mortality. It is alleged that the child was put to the torture and then condemned to death by burning at the stake. This last sentence was not carried out, for the lad was rescued, at almost the last moment, by a courageous white miner, who carried off the boy in the face of the opposition of nearly the whole village.

FIDUCIARY RESPONSIBILITY.

It is a matter of no ordinary moment that while this has been justly termed the age of getting, yet each year the fact is more and more emphasized that it is also the age of giving. If with the power to accumulate there is joined a spirit of benevolence, and a wise discrimination in its exercise, then may men be earnestly con-

gratulated for the noble services they may render to their fellows. If the record could be accurately stated it would be found that by far the larger amounts contributed are the aggregates of pittances given by the masses, and which go so largely to the supply of daily needs. So, too, in matters of collections for all benevolent and religious purposes, the yearly contributions of those with moderate means amount to many millions. In connection with the marvelous developments of wealth which have been made in America within the last half century, not a few, but, rather a multitude of business men have come into the possession of great wealth, and it is a notable fact that in great numbers of instances a princely generosity has been manifested in its bestowment. Hundreds of millions of dollars are thus represented in churches, universities, seminaries, colleges, parks, fountains, galleries of art, and especially in charitable institutions designed for the cure or alleviation of suffering—in homes for invalids, and in hospitals everywhere; and as the years go by this spirit of benevolence is being rapidly developed. Capital seems intent upon giving back to labor its full reward, and more. The outlook in the direction of endowments and bequests was never so hopeful as it is to-day.

But this very fact brings with it its word of caution. There must be no betrayal of trusts. Even of more value than the noble impulse that prompts the giving, is that other priceless possession of *fidelity*.

This matter of wisely handling large amounts of capital in the care and conduct of hospitals and charitable institutions is one that often bears close relation to the medical men in charge. They, too, are often responsible in measure for the direction in which charities shall be bestowed. On the part of these and upon all men charged with fiduciary trusts there rests a grave responsibility.

If the purposes of donors in the future, as they have been mainly in the past, shall be faithfully executed, there hardly seems a limit to the bestowments that will be made for worthy objects; but, if the time shall come when even a few trusted ones shall prove recreant, then, and that suddenly, will the streams run dry and the fountains of benevolence cease to flow. The giving is of more account than the getting, but most of all is the service of faithful stewardship.

MICROBIAN PRODUCTS WHICH FAVOR INFECTION.

The importance attached to matters secreted by pathogenic microbes is constantly on the increase. As a result pathologists now attribute to the secretions the greater portion of the effects which minute organisms produce.

From a purely physiological standpoint microbian products may be divided into the three following groups: 1. Those which exert upon the economy a poisonous influence, and upon which the virulent properties of the microbe depends. 2. Those possessing a vaccinating power; they confer immunity not by accumulating in the tissues but by passing through them and modifying the dynamic power of cells and the chemical qualities of the fluids and tissues. Finally, a third group, which, though themselves non-pathogenic, diminish the power of resistance of the organism to the attacks of other pathogenic varities; and even render forms non-pathogenic virulent.

The effects upon the system of the different products secreted by these microscopic forms have been very thoroughly studied by PROF. CHARLES BOUCHARD of Paris, and the results reached have been recently published in a memoir entitled "Action des Produits Secretés par les Microbes Pathogenes. Paris, 1890." From the *Gazette Hebdomadaire* we translate a review of that portion of the work of Prof. Bouchard relating to the "History of Microbian Products," which diminish the resistance of the organism to the pathogenic agents and thus favor the development of infectious diseases.

EDITORIAL NOTES.

SEVEN HUNDRED PAPERS.—This is the reported number of papers submitted at the Berlin Congress. The paper presented by Professor Bouchard, of Paris, required two hours for its delivery. At that rate, it is difficult to conceive how justice could be done to each contributor, or at what dates discussions would be in order.

THE ANNUAL MEETING OF THE MISSISSIPPI VALLEY MEDICAL ASSOCIATION. — We desire again to refer to the annual meeting of this Association, which will convene Oct. 8 at Louisville, and continue in session for three days. The city of Louisville can afford ample accommodations for

any number of guests, and the profession of that city, whatsoever they undertake, are never found wanting. We not only anticipate a large attendance, but also the presentation of an unusual number of valuable papers. Pleasure and profit will conspire to render this meeting a notable success.

THE AMERICAN RHINOLOGICAL ASSOCIATION will hold its eighth annual session at Louisville, Ky., Oct. 6, 7, 8. All leading subjects relating to nasal and naso-pharyngeal diseases will be opened for discussion by a leading fellow of the Association. The Secretary, Dr. R. S. Knode, Omaha, Nebraska, will furnish any information to physicians desiring to become members. As the date of the first session is three days earlier than that of the meeting of the Mississippi Valley Medical Association it will be feasible, for those who so desire, to attend both Societies, as the meetings of both are to be held in Louisville.

ONTARIO MEDICAL ASSOCIATION.—We have recently received a copy of the manual of this prosperous Association. It is a finely printed pamphlet of twenty-four pages, with revised and amended contents down to June, 1889. It gives the membership and officers to the date of the last Convention, also the Constitution, By-Laws and elaborate Code of Ethics, which latter is essentially the same as that of the American Medical Association. It is a most attractive and serviceable little handbook.

AMERICAN PUBLIC HEALTH ASSOCIATION.—The next meeting will be held at Charleston, S. C. It will convene December 16. The sessions will be continued for four days. Among the topics announced are those of sanitary house construction in its various details, the disposal of sewerage, isolation of hospitals for infectious and contagious diseases, maritime sanitation at ports of entry, the restriction of tuberculosis, etc. We anticipate the presentation of a valuable series of papers in connection with this meeting.

DR. ROBERT STEPHENSON, of Adrian, Mich., died August 11, at Berlin, whither he had gone as a delegate to the International Congress. As his death was sudden, the police officials believed it to be expedient to investigate its causes. A post-mortem was held, and the official verdict was that Dr. Stephenson died from cardiac syncope, superinduced by an overdose of morphia, taken accidentally, as is believed, and not at all with suicidal intent.

THE MICROBE IN LONDON.—Our latest advices are to the effect that cholera is steadily making advances in Russia, in Spain, and along the borders of the Red and Mediterranean Seas; but the notable fact of the week, which seemingly is well authenticated, is that of the appearance of a single case of cholera in London.

Those who are not committed to the view of specific contagion will enquire with emphasis if it be not true, that sporadic cases, as a rule, precede any local development of an epidemic of this disease—cases in which seemingly no means of transmission was possible. In this instance we sincerely hope that no effort will be spared in determining all the circumstances connected with its development. Was there any possible means of communication of this patient with others in any of the infested districts? Do the physicians in attendance unite in pronouncing this to be a typical case of Asiatic cholera? Is there any evidence that the disease is being communicated to other persons in immediate contact with the patient? Facts in such a case as this are valuable, and a critical observance of them on the part of the London physicians will be of special service to the profession.

THE CARE OF THE INSANE IN THE STATE OF NEW YORK.—The redistricting of the State to conform to the new act providing for the care of the county insane, by the State asylums, will be begun in September. The Board, appointed for that purpose, will make a temporary apportionment, subject to future alterations as occasion may dictate. When the division of the State into districts shall have been made, the charge at all hospitals will be the same to the counties for the same class of patients. There is an informal understanding that when the State shall have completed its provisions so as to accommodate all the insane then in the county almshouses, the amounts to be charged to the counties, respectively, will be $2.50 per week for the class of patients that have been under treatment for three or four years, while for the class under treatment for less periods, the charge will be $4.00 per week.

TOPICS OF THE WEEK.

PRESENTATION OF THE GOLD MEDAL TO SURGEON PARKE.

At the annual meeting of the British Medical Association held at Birmingham July 31, on rising to receive the gold medal of the Association, Surgeon Parke was greeted with enthusiastic applause, which was continued for some minutes.

The President said that the reception Surgeon Parke had received rendered necessary only a very short speech from himself. It was comparatively easy to state in words particulars of deeds done in a few minutes or hours, but when they had to speak of acts repeated day after day, week after week, month after month, and even year after year, the task became more difficult. An accumulation of hundreds and thousands of acts performed cheerfully and simply by Surgeon Parke, warmed their hearts and commanded their respect. Coolness of head and stoutness of heart which sustained him in the performance of his always arduous, often loathsome, and constantly dangerous duties were what they had now, in a small way, to recognize. He had authority for stating that but for the state of his health, which, however, they were glad to know was rapidly improving, Mr. H. M. Stanley would have been present, with Mrs. Stanley, to tell them in some detail what Surgeon Parke had done. In Mr. Stanley's absence he (the President) could not do better than quote a few of his published words, which he himself, from having Surgeon Parke as his guest for a few days, could testify were only words of truth and soberness. "This expedition," Mr. Stanley said, "possesses the rarest doctor in the world. He is such a combination of sweetness and simplicity, so unostentatious, so genuinely unobtrusive. We are bound to him by the cords of love. We have seen him do so much out of pure love for his cases that human nature becomes ennobled by this gem. I greatly honor what is divine in man. This gift of gentleness and exquisite sensibility affects even the dullest. May the kindly angels record this nobleness, and obliterate all else." He would not dim the beauty of this exquisite sketch by any words of his own. The material medal was awarded by the Council of the Association, but the honor which it symbolized must come from the true and hearty approbation of all its members. In conclusion he asked the meeting to give three hearty cheers for Surgeon Parke.

This having been enthusiastically done, the President hung the blue ribbon attached to the medal around Surgeon Parke's neck, and addressing him said:

Surgeon Parke, of the Army Medical Service, I have the honor, on behalf of the thirteen thousand members of this great Association, to ask you to accept this medal which we have conferred on you. In their name, and on their behalf, I offer you the right hand of fellowship, and heartily wish you God-speed.

Surgeon Parke, who was greeted with prolonged applause, said: Mr. President, members of the Council, ladies and gentlemen, allow me to express to you my grateful thanks for the honor you have conferred on me by awarding me the gold medal of the British Medical Association. I can assure you that those thanks may be divided into as many parts as there are members in the Association. It is my greatest gratification to know that my services in connection with the Emin Pasha Relief Expedition have been appreciated by members of the profession to which I have the privilege to belong, because I know that there are none more critical, and none who are better judges of the difficulties which have had to be overcome, especially when you consider that for 6,000 miles our only means of transport was on men's heads. I feel not the less gratified that, after three years of marches across Africa, through difficulties and disasters and dangers which, perhaps, the annals of history can scarcely equal, I have the good feelings of my wonderful chief and my brave companions. I especially thank you for this distinction, because it is significant evidence that the British Medical Association, at any rate, approved of my endeavors to carry out the teaching and the training and the principles for which I am indebted to the profession. I will not occupy you very long, as I expect that since Stanley's book has been published, most of you have crossed Africa in much quicker time than I did. However, a few details can bear repeating. One of the brightest features in connection with the expedition was the good feeling which existed amongst the Europeans and amongst Europeans and blacks. We were all strangers at first, but when we emerged from Africa, after three years' travels, we were the greatest friends. I have always received the greatest assistance both from my illustrious chief, Mr. Stanley, and from my companions. Our mortality was very great, especially amongst the blacks. The Europeans were particularly fortunate; out of twelve ten emerged out of Africa safe and sound. Of the two who died one was murdered, and the other died about 600 miles away from us. Amongst the black people we only brought back about 300 out of 700. There was a great difference between the blacks and the whites during the starvation period—the period of greatest trial. The white people seemed to get along much better; they had more moral pluck and more energy; they seemed to have more to live for than the black people, who showed very little resistance. The object of the expedition was the relief of Emin Pasha, and it has been successful. We found Emin Pasha. After five months' and a half marching we reached the objective point, which was the Albert Nyanza, and by that time we had lost 50 per cent. of our men. However, we came to the lake, and found Emin Pasha, and brought him to the coast. I will not detain you by entering into any further details, excepting to say that you know what has happened since—how he fell out of a window on the coast. He had not been in a two story house for fourteen years, and thinking he was going out at the door, he walked on the veranda, and fell down and broke the base of his skull. You also know what has happened to Mr. Stanley. I left him the other day in the best of spirits, and as happy as the day is long. My other companions also are in the best of health. Passing through Africa we came across different tribes, and found the country to be beautiful and fertile, the interior being like a garden.

Some of the tribes were extremely handsome, with well-marked features, thin noses, thin lips, and high foreheads. No doubt, in a short time, Africa will be opened up to civilization. They are making three railways there—one south, one east, and one from the Congo—and those will be a great medium of civilization. Some of the tribes in the middle of Africa were considered to possess horrible and diabolical faces, but if some of the Wahunna ladies were introduced into England, I think there would be a great emigration of energetic and enterprising young men. Allow me again to thank you for this medal, which is second to no other decoration that I have received. I thank you most sincerely for it.—*British Med. Journal.*

THE GROUND-WATER AND DRINKING-WATER THEORIES OF THE ETIOLOGY OF CHOLERA.

The following is translated from the *Annales de l' Institut Pasteur*, and published in the *Abstracts of Sanitary Reports*, July 25:

The theories of the etiology of cholera, known as the ground-water theory and the drinking-water theory, and which are represented by the Berlin and Munich schools, continue to excite much controversy in Germany. The question of practice is the animating motive of the discussions. The theory, which attributes microbic disease to the transmission of germs by means of drinking-water, is clear, simple and definite in its indications, and consequently, in the prophylactic measures it suggests. The Pettenkofer or ground-water theory makes the evolution of a sporadic case or of an epidemic depend on a host of factors against which it is impossible to guard.

The city of Munich has a strong underlying body of subterranean water, the variations in the level of which are constantly in the numerous wells of the city. The epidemic at Munich, in 1854, was preceded by a remarkable elevation, and accompanied by as remarkable a depression of the level of this subterranean water. According to the ground-water theory, a close relation exists between these facts and the evolution of the epidemic. The variation of level allows the water to permeate the soil, which it leaves humid on subsidence.

The danger point is reached when the soil has attained the requisite degree of humidity. The cholera germ is innocuous when it leaves the human organism, and to infect another organism it must mature and complete a new phase of its existence outside of man and in a suitable medium. The medium is the soil, moist, aerated, and saturated with impurities.

The school represented by Koch objects to this, that the maturation of the cholera germs in the soil is purely subjective, and that none of the pathogenic germs known offer any parallel to the conditions claimed for the germ of cholera. The germs of small-pox and scarlet fever pass directly from one patient to another, and one individual may initiate an epidemic. The bacillus anthracis is not only virulent when it leaves the organism of the animal whose life it has destroyed, but its virulence is increased by transmission through the same species, as has been demonstrated by the studies in septicæmia made by Coze, Feltz and Davaine. It is true that anthrax is sometimes of telluric origin, and Koch has shown by what means the virulent microbe is conserved, but there is a vast difference between the possibility of the conservation of the bacillus in the soil, and the necessity for it to pass through the soil for it to become virulent. It rests with the advocates of the ground-water theory to show the mechanism for the exodus of the morbid influence from the soil.

Vogt attributes its liberation to oscillation in the pressure of the atmosphere and the expulsion has been accounted for by an elevation of the subterranean level. But Noegeli, Pumpelly, Renk and Miquel have shown that passage through a layer of humid earth filters a current of air, instead of charging it with germs.

When the soil is dry the air current may take up dust in which there are germs, and attrition under the influence of sun and wind may create whirlwinds of dust, the respiration of which is dangerous. But in this case the microbe must support dessication, and supposing it retained, living and virulent in the air, the means by which it is introduced into the human organism are left undetermined. The way of pulmonary inhalation must be rejected.

Cholera, as at present understood, is localized in the intestinal canal. The germs might be arrested by the saliva and conveyed to the stomach, but Koch has shown that they can support only a short stay there. The advocates of the ground-water theory, however, accept penetration of the germ into the organism by way of the saliva and reject the transmission by food and water.

Dr. Hueppe, in a recent work, has undertaken to find a common ground on which the two theories may meet. His conception is that the cholera bacillus may, like most pathogenic bacteria, exist in the saprophytic state. Frankel has demonstrated that it finds in the superficial layers of soil the necessary conditions of temperature, that it resists dessication and putrefaction and the rivalry of other species.

It leaves the soil, not matured, as Pettenkofer claims, but vigorous and capable of resisting the action of the gastric juice, when by deglutition of saliva, respiration, drinking water, or alimentary substances it has reached the stomach. It develops in the intestinal canal, producing the toxic agents that impart to cholera its frightful character. When it leaves the human organism it ceases to be infectious and recovers its viruleuce by contact with the air or in the soil. If air and oxygen are deficient the germ perishes. If both are present in small quantities it can lead an aerobic existence at the expense of the materials it encounters.—*Sanitary News.*

LEGISLATION FOR LEPERS.

A telegram from Calcutta states that the question of the proper housing and care of lepers is attracting much attention. A public meeting has been held at Bombay and a committee appointed to frame a scheme. The subscription already promised exceed 12,000 rupees; the Governor has headed the list with 1,000 rupees. The Calcutta Health Society has addressed the Government urging the necessity of legislation, and pointing out that all leper asylums should be scientifically regulated, and should be under Government control.

PRACTICAL NOTES.

JACCOUD'S NUTRITIVE ENEMA.

An enema of great nutritive power, and valuable in cases of cancer of the stomach, closure of esophagus, etc, is produced by M. Jaccoud as follows:

℞. Beef broth (freshly made), 8 ounces.
Wine, 4 ounces.
Yolks of eggs, 2.
Dry pepton, 1 to 4 drachms.

℥. Sig.: Mix and make an enema to be injected in small portions at intervals during the day.

ANTISEPTIC LIQUID.

The following formula is in use in some of the hospitals and dispensaries as an antiseptic dressing.

Boric acid, 240 grains.
Salicylic acid, 30 grains.
Water, 2 pints.
Dissolve.

THE NEW METHOD OF TREATMENT IN ERYSIPELAS.

1. *Method of Rosenbach.*—Consists in first washing with soap not only the affected part, but the surrounding healthy skin, then applying each day a solution of carbolic acid (5 per cent.) dissolved in absolute alcohol. Results, very brilliant as regards both the progress of the malady and the febrile phenomena. The use of absolute alcohol by itself has also produced favorable results.

2. *Method of Nolti.*—The affected parts and surrounding skin are covered twice daily with mucilage of gum arabic, mixed with from 3 to 5 per cent. of carbolic acid. Good results. Dr. Ebstein mixes the carbolic acid with vaseline.

3. *Method of Koch.*—By means of a soft brush, we apply a thin and regular covering of the following pomade:

℞. Creoline, 1 gram.
Iodoform, 4 grams.
Lanoline, 10 grams.

The parts are then covered with leaves of guttapercha. This has given good results, especially in erysipelas of the face and head

4. *Method of Nussbaum and Brunn.*—Ichthyol with or without collodion. Results favorable, and very prompt.

5. *Method of Hallopeau.*—A solution of 1 to 20 of salicylate of soda is soaked in a mask of several thicknesses of linen and applied over the parts, after which it is covered with rubber bands, to prevent evaporation. Relief almost immediate; cure in from three to five days.

6. *Method of Hueter.*—Injections of carbolic acid in the healthy skin, in doses of from 10 to 15 grams distributed in several punctures, at 1 or 2 cm. from the edges of the affected parts, with the following solution, recently prepared:

℞. Carbolic acid (pure).
Absolute alcohol, āā, 3 grams.
Distilled water, 94 grams.

Very painful. Only applicable in severe cases of the head or face.

7. *Method of Kraske.*—Scarify the edges before application of the antiseptic substance. Dr. Lawenstein advises that the incisions should be made exclusively in the healthy skin, after which the parts are enveloped with a solution of carbolic acid or sublimate.

8. *Method of Wolfler.*—Mechanical compression by means of adhesive plaster applied on the healthy skin on the borders of the affected parts, so as to completely surround them.—*Le Bulletin Medical.*

RESORCIN IN EPITHELIOMA OF THE FACE.

Dr. Mario Luciani reports two cases of "cutaneous epithelioma" in which he claims to have effected a complete cure by the application of an ointment containing resorcin. In one case the patient, a healthy woman, æt. 54, had had a small red nodule on the forehead for four years. It then began to grow larger, and became ulcerated, the ulcer having hard borders and a foul base, and being very painful. As the disease was spreading and the patient would not hear of anything in the nature of a surgical operation, Dr. Luciani directed that an ointment composed of 30 grams of resorcin to 100 grams of vaseline should be applied once a day to the ulcerated surface after previous cleansing with a 2 per cent. watery solution of borax. In a month the ulcer assumed a healthy appearance, its edges softened, and the burning and shooting pain formerly complained of ceased. After three months' further continuance of the treatment the ulcer completely healed. The second patient was a woman, æt. 60, who for about a year had noticed a small lump on her upper lip near the corner of the mouth on the right side. Ulceration took place, and the course of events was similar to that in the previous case. The same treatment was followed by an equally happy result. While Dr. Luciani is to be congratulated on his success, some doubt may, perhaps, in the absence of microscopic or other conclusive evidence, be expressed as to the true nature of the disease with which he had to deal.

BOROGLYCERIN CREAM.

The following preparation is said to be excellent for chapped hands, lips, etc.: Dissolve one part of boric acid in twenty-four parts of glycerine; add to this solution five parts of lanolin free from water, and seventy parts of vaseline. The preparation may be colored and perfumed.

FOREIGN CORRESPONDENCE.

LETTER FROM LONDON.

(FROM OUR REGULAR CORRESPONDENT.)

Influenza an old acquaintance in Ireland—Alarms of Cholera—Asepsis of Catheters—Death of Sir William Hoffmeister—Sanitary Condition of Workmen's Dwellings in Liverpool—A New Way of Committing Suicide.

Influenza, according to the Irish Local Government Board, is an old acquaintance in Ireland. A passage is quoted from the "Annals of Ulster," A.D. 1326: "Awful thunder and lightning this year which destroyed the corn and produce of Erinn so that it was blanched and waste. An epidemial disease common throughout all Erinn which was called 'Staedan' (prostration), which affected during three or four days every person so that it was second only to death." In 1328 influenza is recorded under the name of "staedan" in the "Annals of the Four Masters" and in the "Annals of Connaught," and under the name of "Murre" in the "Annals of Clon Machoire." Several outbreaks of influenza are mentioned in the fourteenth century in Ireland. In 1850 the same disease is described as a strange kind of sickness called "the gentle correction" or influenza.

Alarms of cholera keep continental countries on the alert. Paris was desperately frightened by the announcement of a suspicious case, which had ended fatally and seems to have been ordinary, not Asiatic, cholera. Five cases of cholera nostras occurred at a village near Pesth with one death, and eleven Mecca Pilgrims have succumbed to the true cholera on the Red Sea. The epidemic affects Mesopotamia and is very severe round Baku, on the Caspian Sea, where seventy deaths are reported, the disease being aggravated by the terrible heat. Extreme heat prevails throughout South Russia, so that the authorities are in daily dread of the epidemic appearing.

The subject of asepsis of catheters has been occupying attention. The questions taken into consideration are whether it is always necessary and the dangers to which its neglect may give rise, and, secondly, by what means the asepsis may be best and most easily brought about. The first proposition is considered incontestible. It is generally admitted that though catheterism may be practiced for a considerable length of time without any special precautions as regards perfect asepsis of the instrument and without any ill consequences following, yet such facts should not promote the idea of perfect innocuity. The general complications which appear in the course of catheterism are thought not to be well understood. The urinary fever in its varied types—that of acute frank access, similar to the access of an intermittent, or the slow fever of the continous type—is attributed generally to the absorption of decomposed urine, or by another theory, to a reflex congestion causing arrest of the renal secretion. Dr. Picard gives it as his opinion that all these accidents are caused by infection of the urinary tracts and are due to want of cleanliness of the instruments employed, and contends that with proper care a clean aseptic catheter, no matter how often used, never occasions purulent cystitis, urethritis, orchitis, urethral abscess or urinary fever. With regard to the means to be employed to secure asepsis, Dr. Picard confines himself to those easily realized by the general practitioner. Metallic instruments are those which are the most readily disinfected. Boiling in water or in salt water is regarded as giving the necessary security. Soft or semi-soft instruments are now usually employed and require greater care. The soft red caoutchouc Nélaton sound he dips for a few seconds into boiling water or keeps it constantly in a strong antiseptic solution such as a 5 per cent. carbolic or 1 per 1000 sublimate solution, and washes the instrument thus kept in strong antiseptic solutions before using, either in boiling water or in a solution of boracic acid. After boiling, the instrument may be taken up by a clean forceps and placed in a jar containing a saturated solution of boracic acid. A thread previously fastened to the end of the catheter is slipped into a slit in the cork and the instrument is suspended and can be readily withdrawn without handling when required for use. Semi-soft gummy catheters are found not to be so easily sterilized. Dr. Picard places such an instrument in a tube whose open end is then filled with absorbent cotton wool. The tube is then placed in boiling water and allowed to remain there at least half an hour. This process is repeated several times at intervals of twenty-four hours, for while this temperature of 100° C. destroys adult bacteria it is without effect upon the spores or germs.

The death is announced of Sir William Hoffmeister, for many years surgeon to the queen, the Prince of Wales and the royal family in the Isle of Wight, which occurred at his residence at Cowes after a long illness. He was Honorary Consulting Physician to the Royal Isle of Wight Infirmary and Surgeon to the Royal Yacht Squadron.

Dr. Hope, in his inaugural address to the Society of Medical Officers of Health, said that the corporation of Liverpool possessed a block of workmen's dwellings, known as Victoria square, which were second to none in the kingdom. The buildings, which provide accommodation for a thousand persons, occupy a part of a site on which formerly 1,300 persons were living under the worst sanitary conditions. They are five floors in

height and are divided by party walls into thirteen separate sections, two of the blocks have shops on the ground floor, and the remainder are entirely devoted to dwellings. Each dwelling has a separate entrance from the common staircase and is a tenement in itself. There are altogether 271 tenements and a superintendent's house. The water-closets are two on each floor for the joint use of the four tenements. They are thoroughly disconnected from the tenements and are of approved sanitary construction. The dust and ashes are disposed of through a ventilated shoot formed in the angle of the lobby leading to the water-closet, which appears to answer well; ordinary bins are provided for other refuse. Each tenant has the sole use for a fixed day of a spacious laundry appropriately lighted and fitted up, placed centrally on each floor for the use of the four tenements on that floor. On each side of the laundry is a scullery with double sink, one sink for each tenant. The interior of the tenements is attractive and cheerful, the walls are plastered and finished in distemper, the necessary cupboards, drawers, bunkers, etc., are provided. The windows are divided into small squares, the lower portion having tinted glass. They are fitted with stained and varnished venetian blinds. Sewerage and drainage have received the closest attention. The rents charged vary from 6s. per week for the three-roomed tenements to 2s. per week for the one-roomed tenements. There has been a great improvement in the death-rate.

A strange attempt at suicide is recorded. At Earlbourne, in Sussex, a tradesman was charged with attempting to kill himself by driving four long nails into his head. A medical man produced four long nails which he had with great difficulty withdrawn. These nails had penetrated three inches and entered the brain, but to the surprise of the medical staff at the Memorial Hospital the man had fully recovered. The would-be suicide said he drove the nails into his head in succession and that he had felt better since the occurrence. He is now sane and able to attend to his business.

Dr. T. Lauder Brunton delivered an address on Chloroform Anæsthesia before the Section of Pharmacology of the International Medical Congress in Berlin, and Mr. Alban Doran was appointed English Secretary to the Section of Obstetrics and Gynecology at the same meeting.

G. O. M.

BACCELLI will probably be the President of the next International Medical Congress which will be held three years hence in Rome. As Rome is too hot and not altogether healthy for foreign visitors in early August, the meeting will probably be held at the end of September.—*British Medical Journal.*

DOMESTIC CORRESPONDENCE.

LETTER FROM NEW YORK.

(FROM OUR OWN CORRESPONDENT.)

Opening of the new Croton Aqueduct—The Electrocution at Auburn—Important recommendation of the State Commission in Lunacy—What the Vanderbilts are doing for the Workingmen of New York—The Rev. Chas. L. Brace and the Children's Aid Society of New York.

In the last letter a brief reference was made to the opening of the new Croton aqueduct; but this is a matter of so much importance to the health and prosperity of the community, that a more extended notice of this great undertaking may be of interest. The opening took place on the 15th of July, and was without public ceremonies, though the Mayor and other city officials were invited to be present when the water was first turned on at the big reservoir in Central Park. This is in marked contrast with the opening of the old Croton aqueduct, which was made the occasion of a general celebration, with elaborate exercises and marked demonstrations of rejoicing everywhere in the community.

The new aqueduct is unquestionably the greatest engineering work of the kind ever undertaken and successfully carried out. Through nearly all its course from Croton Lake to the gate-house at 135th street, it is a tunnel through solid rock, sometimes more than 200 feet below the surface of the ground; and, instead of crossing the Harlem River by the simple device of iron pipes carried on a bridge of masonry, the tunnel takes the form of an inverted syphon below the river's bed, going to a depth of 300 feet to find secure rock to withstand the tremendous pressure. The aqueduct, as has been stated in THE JOURNAL, is capable of delivering two hundred and fifty million gallons of water per day, or nearly three times as much as the old one; while its cost has been less than twice as much, without taking into account the additional storage reservoirs that will be required to afford a steady supply of water. This is not only by all odds the largest aqueduct, but it is also the longest continuous tunnel, in the world; and when the dams and reservoirs subsidiary to its full and permanent operation are completed, the system of waterworks will be the most extensive and costly ever constructed. It was, therefore, altogether appropriate that, on the day of the opening, the Aqueduct Commissioners should adopt the following resolution:

"*Resolved*, That as our citizens enjoy to-day, by the utilization of the new aqueduct for the first time, the benefits of an undertaking which stands an unparalleled monument to engineering skill, and which in every way contributes to our city's health and welfare, the members of this Commission warmly congratulate the public of the City of New York upon the virtual fruition of an enterprise of such incalculable magnitude and merit."

The main trouble for years has been, not a lack of water at the source of supply, but a lack of means for bringing it to the city. Most of the time the reservoir, or lake, at Croton village, has been overflowing, and the supply has gone to waste over the dam. The means for bringing the water to the city in ample quantity is therefore now provided. The natural supply, however, is unequally distributed through the year, and in order to get the full benefit of it, there must be sufficient storage capacity in the reservoirs to hold the surplus of wet periods for use in dry periods. Otherwise, a prolonged dry period would be perilous to the city's supply, and the aqueduct, alone—although entirely satisfactory in time of abundance—would be useless. Hence the absolute necessity of providing storage facilities in the Croton Valley commensurate with the aqueduct facilities afforded. The work of providing for the city's future needs will not be finished, therefore, until means have been adopted for storing the entire supply of the Croton watershed, in order that its distribution through the aqueducts may be equalized, not only throughout the months of each year, but through the succession of wet and dry years.

The capacity of the present Croton Lake is about nine million gallons, and subsidiary reservoirs further up the valley will more than double the provision for storage. But this will be insufficient either to receive the full supply or to hold back enough to provide against a protracted dry period. A dam will therefore be required in the lower part of the valley which will raise the capacity of the main reservoir to thirty million gallons; and this the great "Quaker Bridge dam," which is in contemplation, but which has not yet been definitely decided upon, would accomplish. The construction of such a dam is unquestionably essential to the completion of the system that will enable the city to make use of the entire Croton water supply. With it and the new aqueducts, New York will be amply provided for water until such time in the future when the increasing growth of the city will render it necessary to seek for a new source of supply.

The electrical execution at Auburn has naturally been the subject of universal attention of late. While many of the highly colored newspaper reports of it have been filled with all sorts of sensational horrors, there can be no doubt that this initial trial of the method, although managed apparently in a somewhat bungling manner, was entirely successful in producing death without pain to the subject. It cannot but be admitted, however, that the apparatus employed was defective, and that it did not work properly. For months strenuous efforts had been made in the interest of the electrical company whose dynamo was to be used to prevent the execution of the law in Kemmler's case, and the warden of Auburn prison was seemingly in sympathy with these efforts. This has for the most part been attributed to his repugnance to the unpleasant duty that was to fall to him in being the first to execute a death sentence by the new process, but the tinkering with the apparatus, and the change of the fatal chair from one room to another at the last moment, without apparent reason, gave a suspicious appearance to the final preparations.

Wherever the trouble may have been, it is clear that the arrangements were bad. It was the opinion of the experts consulted on the question that, to induce certainty in instantaneously producing death, a current of from 1,500 to 1,800 volts should be used. That employed in this instance, however, seems to have varied in a very uncertain way from 700 to 1,300, and never to have risen above the latter figure. While the current was weaker than it should have been, the contact of the electrodes seems to have been imperfect. Moreover, the dynamo was a thousand feet away from the death chair, instead of being close at hand, and the system of signaling to the man in charge of it appears to have been clumsy or misunderstood in the working. Whether death was produced by the first passage of the current for seventeen seconds or not, there can be no question that the man was instantaneously rendered unconscious by its force. As certain movements were noticeable in the body after the current had been stopped, however, it was certainly very proper that it should be turned on again, and continued until there could be no possible doubt of his death. The first trial of execution by electricity was of necessity an experiment, and it was not conducted with that care and coolness that were requisite to insure perfect success. But it was made clear that, with the current that has been recommended for the purpose, with appliances free from defect in construction and operation, and with a firm and confident application of the process, there could hardly be any question of instant and painless death.

If the law requiring infliction of the death penalty by electricity is to continue in force, it would probably be advisable that it should be so modified as to provide but a single place in the State for such executions, instead of three, in order that the best possible chances for the successful application of the method might be afforded. As Dr. Shrady, editor of the *Medical Record*, who was one of the physicians present at the execution, states, the experiences in the Kemmler case have shown many difficulties in the way of a general adoption of the method of killing by electricity. "It is," he says, "far from being simple in its application. It requires careful and elaborate preparation. It multiplies machinery which, without expert manipulation, is liable to fail in its working and bring about disastrous results. It may be a source of danger to the exe-

cutioners and spectators." It is interesting to note that more than half an hour after the current was turned off the temperature of Kemmler's body, taken at the back of the neck, was 1° higher than ordinary blood temperature. In consequence of this, although all the physicians present concurred in the opinion that the man was positively dead, the autopsy was very properly postponed for three hours, as it was desired that no ground should be afforded for the slightest suspicion that he died under the scalpel, and not from the electric current. On removal of the skull cap the dura was found normal in texture, somewhat dull in color, particularly over the area corresponding with the zone of contact. In the pre-Rolandic region the meningeal vessels, over a considerable surface, were filled with carbonized blood, while on the internal aspect of the calvarium the meningeal vessels in the dura appeared to be black and carbonized. The carbonized vessels were so brittle that their ends were torn off with the calvarium, and presented a broken, crumbly appearance. This carbonization was limited in an abrupt manner, and the other meningeal vessels contained blood of a crimson-like hue corresponding to the outer burn produced by the current. Over the left hemisphere, ⅓ of an inch to the left of the median line, there was a deep carbonized spot, corresponding with the carbonized portion of the calvarium. On handling the pons and medulla they were found to be warm, and by a thermometer inserted in the fourth ventricle the temperature was noted at 97° F. This corresponded with the area of temperature on the back of the neck, which was noted at 99° two hours after death, and 97.5° three hours after death. Capillary hæmorrhages were noted in the floor of the fourth ventricle, in the third ventricle, and in the anterior portion of the lateral ventricle; while the perivascular spaces appeared to be distended with serum and blood. The brain cortex in the area of contact was sensibly hardened to one-sixth of its depth, where there was a broken line of vascularity; but the spinal cord showed no gross appearances of pathological condition. The blood taken immediately after death showed under the microscope a markedly granular condition, almost suggesting an electrolytic dissolution of the red corpuscles.

At its last quarterly meeting, recently held in Albany, the State Commission in Lunacy, as the result of a systematic visitation of the various State hospitals for the insane, adopted a series of important recommendations for the prevention of fires in these institutions, and for the safety of the patients in case of the occurrence of fire. If these regulations were in force in insane asylums generally, it is safe to say that disastrous fires would not occur in them so frequently as is now the case.

Mr. Cornelius Vanderbilt, while in London during the early part of the summer, made a thorough inspection of the People's Palace there, and in conjunction with his mother, Mrs. Wm. H. Vanderbilt, has just commenced the erection of a popular club-house and mission building which will embody many of the most useful and attractive features of that admirable charity. It is to be known as St. Bartholomew's Mission, and its general direction will be under the management of St. Bartholomew's Church, which the Vanderbilt family attend. It is especially designed for the use of the large tenement-house population residing to the eastward of the Grand Central Railway Station, and the building is to be six stories in height, with a frontage on Forty-second street of 75 feet, and a depth of 100 feet. In the basement there will be a very large swimming bath, with a heating apparatus to warm the water in winter, and it will be for the use, at different hours, of both males and females. On the same floor there will also be a kitchen and large dining-room, and a workroom where unskilled laborers who are out of employment can obtain temporary work. One of the floors is to be fitted up and fully equipped as a first-class gymnasium; and on the various other floors there will be a large chapel, a number of rooms for meetings, lectures and entertainments, sewing-rooms, rooms for boys' clubs, an extensive library and reading-room, etc. The cost of the whole will be over $250,000, and altogether St. Bartholomew's Mission will be an institution which cannot but have a most salutary effect upon the physical, mental and moral welfare of the poor people in whose midst it is situated.

Among the various charities of the city there is none that is deserving of more unstinted praise or that has accomplished a more noble and extensive work, than the Children's Aid Society, and the sad news has just been received of the death, in Switzerland, of the Rev. Charles L. Brace, the founder and Secretary of the Society. While traveling in Europe some forty years ago, he made a study of the management of the schools, the prisons and the reformatory institutions in various countries; and he was especially impressed with the work of the Rauth Haus in Hamburg, and the Ragged House in London. When he returned to America he was filled with the subjects which he had lately been studying, and his attention being naturally turned to the condition of the tenement districts and of the immigrant poor in New York, early in 1853 he succeeded in interesting a large number of philanthropic people in the organization of the Children's Aid Society.

The great idea in Mr. Brace's work was to enable the young to help themselves, and since the organization of the Society more than 70,000 children have been placed in good homes in the country, many of them in the West; a large number of them having now grown up as useful and worthy citizens. Another feature of the work

was the establishment, in various parts of the city, of lodging-houses for boys and girls, and the books show that more than 200,000 young people have availed themselves of the comforts of these lodging-houses since they were started. Mention should also be made of the industrial schools, the summer homes for infants and young children, and the medical service among the tenement population which the Society has organized and maintained.

The first examinations for both law and medical students, under the new law, will be held at the College of Physicians and Surgeons the latter part of September; all such students not holding a college degree being required to pass a preliminary examination of substantial equivalents.

P. B. P.

The New York State Examination Act.

To the Editor:—Under the above title a correspondent of THE JOURNAL, Dr. Alfred Ludlow Carroll, of 30 West Fifty-ninth street, New York—we cheerfully give his name and address in full—offers extended criticism in your issue of August 23, 1890, of the recent statute enacted by the legislature of this State creating boards of medical examiners for the license to practice.

In the third paragraph of this singularly clear, logical and concise communication occurs one sentence to which I beg briefly to reply. It is worded as follows:

> According to its report for 1889, its members numbered less than 200. . . . . Yet from this small circle are to be exclusively appointed the arbiters of questions which concern the whole profession throughout the United States.

This refers to the Medical Society of the State of New York, which by the statute above referred to, is charged with the duty of nominating to the Regents of the University one of the boards of medical examiners to be created.

The Medical Society of the State of New York derives its members from the county medical societies, the New York Academy of Medicine,[1] and the incorporated medical schools, which send delegates to the State society; these delegates, after having served three years as such, during which time they must have attended at least two annual meetings, become eligible to permanent membership. The number of permanent members in 1889 was 194, and in 1890 it had increased to 229, besides 33 retired permanent members. The number of delegates provided by law is 145; this would give an aggregate of 374 members entitled to vote at any meeting on any question. It is safe to say that these 374 votes represent a constituency aggregating upwards of 4,000 physicians. For various and obvious reasons not all of these voters can attend every meeting; at the meeting of 1889, 82 delegates and 92 permanent members were in actual attendance—a safe proportion of the whole, one would say, to act upon any question.

I have already said enough to show the basis of the organization of the Medical Society of the State of New York—a plan which has received editorial commendation in a recent number of THE JOURNAL. This much seems due to your readers, lest they infer from the paragraph quoted from your correspondent that it was "a small circle," and not a representative body deriving its powers from a large constituency, that should nominate the board of medical examiners "which concern the whole profession throughout the United States." This has been substantially the plan of its organization since its charter was granted by the legislature in 1806. It is a society created by law, recognized by its statutes, and acting within its limitations.

With the other questions so ably discoursed upon by your correspondent I have not thought it proper to deal at this time. The Regents of the University surely are competent to defend themselves, and a trial of the law will demonstrate its efficiency or the reverse; then, if need be, discussion in regard to amendments will be in order.

WILLIAM WARREN POTTER.

284 Franklin street, Buffalo, N. Y.

[1] The New York Academy of Medicine 5 delegates, the incorporated schools one each, and the county societies one for each assembly district.

BOOK REVIEWS.

CHEMISTRY, ORGANIC AND INORGANIC, WITH EXPERIMENTS. By CHARLES LOUDON BLOXAM. Seventh Edition, Revised and Edited by JOHN MILLAR THOMSON, Professor of Chemistry, Kings College, London, and ARTHUR G. BLOXAM, Demonstrator of Chemistry, Royal Agricultural College, Cirencester. Philadelphia: P. Blakiston, Son & Co., 1012 Walnut street. 1890.

The seventh edition of this familiar text-book is now presented to the public. A thorough revision of the work has been made. In order that it might fully represent the latest advances in chemistry, much of the matter has been re-written. In each department there is a vast amount both of theoretical and practical instruction. This is especially true of the chapter which treats of the metals.

The latest views with reference to organic chemistry have required that this part of the work should be materially revised, and the chapter upon the chemistry of vegetation is entirely re-written. The "new remedies" find their appropriate places in the text, and add value to the work. Much of valuable instruction is contained in the closing portion of the work, which treats

of "the useful application of the principles of organic chemistry."

It is a substantial, finely printed and illustrated work, suited alike for the library and the laboratory. For sale by A. C. McClurg & Co., 117–121 Wabash avenue, Chicago. Price, $4.50.

A MANUAL OF ORGANIC MATERIA MEDICA.—Being a guide to Materia Medica of the Vegetable and Animal Kingdoms, for the use of Students, Druggists, Pharmacists and Physicians. By JOHN M. MAIRCH, Ph.M., Ph.D., Professor of Materia Medica and Botany in the Philadelphia College of Pharmacy. Fourth edition, with two hundred and fifty-nine illustrations. Philadelphia: Lea Brothers & Co. Chicago: A. C. McClurg & Co. Price, $3.00.

Three editions of this work have been exhausted within the last eight years, and this, the fourth, is required to meet the continued demand. Prof. Mairch is so well known to students, pharmacists and physicians that his work has little need of commendation. The physical characters of drugs are well described, but the more important feature, and which gives special value to the book, is his effort, so far as present experience will permit, to clearly set forth the medical properties of the proximate principles of medicines, and to clearly set forth the effects of solvents in order to determine for each its proper menstruum, and also to carefully avoid incompatibilities. The work bears evidence of careful revision, and contains the results of the latest investigations in this important branch. The materia medica of the western continent will yet require a vast amount of careful investigation, and the present work is of special value in this field.

MISCELLANY.

TOMATOES AS FOOD.—A somewhat enthusiastic discussion is going on as to the alleged great value of the tomato as food, and its alleged influence on dyspepsia and liver complaints. All this is in a measure apocryphal, but that tomatoes, whether cooked or uncooked, but especially uncooked, form a very wholesome element in diet is unquestionable. No doubt where it is possible to follow the advice of growing your own tomatoes as well as eating them, the necessary outdoor exercise in gardening involved is excellent, and we endorse the advice: Grow your own tomatoes and eat them, if you have a garden.—*British Medical Journal.*

LETTERS RECEIVED.

Dr. A. B. Brackett, Goldfield, Ia.; J. F. Madden, New York; Dr. W. M. Findley, Altoona, Pa.; Alice L. Smith, Boston; Dr. F. R. Zeit, Medford, Wis.; Dr. J. N. Eldred, Chesaning, Mich.; Dr. C. A. Jessup, St. Louis, Mo.; Dr. W. Eustis, Farmington, Minn.; New York Pasteur Institute; Dr. J. H. Eskridge, Chicago; Dr. J. R. Barnett, Neenah, Wis.; Dr. M. G. Koll, Cleveland, O.; Dr. C. L. Hatfield, Farmer City, Ill.; J. H. Chambers & Co., St. Louis, Mo.; Dr. G. W. Galloway, Findlay, O.; Dr. R. J. Dunglison, Philadelphia, Pa.; Galvano Faradic Mfg. Co., New York; J. Walter Thompson, New York; Geo. S. Davis, Detroit, Mich.; Dr. Wm. B. Atkinson, Philadelphia, Pa.; E. Steiger & Co., New York; Henry Bernd & Co., St. Louis; Dr. C. L. Kinnaman, Cleveland, O.; Dr. C. R. Schaefer, Indianapolis, Ind.; Dr. C. W. Richardson, Washington; R. W. Gardner, New York; Dr. D. B. Collins, Madison, Wis.; Geo. Herbein, Ph. G., Denver, Col.; Dr. J. D. Scouller, Pontiac, Ill.; Dr. Wm. B. Davis, Cincinnati, O.; Dr. W. H. Johnson, Dudley, Pa.; Dr. J. B. Burnett, Newark, N. J.; Dr. W. L. Bullard, Columbus, Ga.; Dr. F. W. Hays, Indianapolis, Ind.; Dr. J. T. Jelks, Hot Springs, Ark.; Dr. M. H. Garten, Lincoln, Neb.; Dr. J. B. Matteson, Brooklyn, N. Y.; Miss L. Brittain, Cincinnati, O.; Dr. Richard H. Harte, Philadelphia, Pa.; D. R. Craig, Keokuk, Ia.; Dr. J. E. Boylan, Cincinnati, O.; Dr. A. B. Patterson, Atlanta, Ga.; Dr. W. F. Rochelle, Jackson, Tenn.; Parke, Davis & Co., Detroit, Mich.; W. P. Cleary, New York; Dr. T. E. Cunningham, Cambridgeport, Mass.; Dr. W. C. Hamilton, Philadelphia; Dr. H. H. Peachy, Loveland, O.; Chas. H. Phillips Chemical Co., Dr. C. H. Knight, New York; Dr. H. H. Roedel, Lebanon, Pa.; Dr. E. Chenery, Boston, Mass.

Official List of Changes in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from August 16, 1890, to August 22, 1890.

Capt. George McCreeny, Asst, Surgeon, leave of absence granted by orders No. 84, Ft. Warren, Mass., August 15, 1890, is hereby extended fifteen days. S. O. 193, Hdqrs. Div. of the Atlantic, Governor's Island, New York City, August 15, 1890.

By direction of the Acting Secretary of War, the retirement from active service this date, by operation of law, of Brigadier General John Moore, Surgeon-General U. S. Army, under the provisions of the Act of Congress approved June 30, 1882, is announced. General Moore will repair to his home, Bloomington, Ind. Par. 2, S. O. 191, A. G. O., Washington, August 16, 1890.

By direction of the Acting Secretary of War, First Lieutenant Charles F. Mason, Asst. Surgeon, is relieved from further temporary duty at Ft. Logan, Col., and will report for duty at his proper station (Ft. Washakie, Wyo.). Par. 3, S. O. 191, A. G. O., Washington, August 16, 1890.

By direction of the Acting Secretary of War, a board of medical officers, to consist of: Major Joseph V. D. Middleton, Surgeon; Major Clarence Ewen, Surgeon; Captain William E. Hopkins, Asst. Surgeon, will assemble at the U. S. Military Academy, West Point, N. Y., at 11 o'clock A. M., August 27, 1890, or as soon thereafter as practicable, to examine into the physical qualifications of the candidates for admission to the Academy. Par. 1, S. O. 192, A. G. O., Washington, August 18, 1890.

Capt. Walter Reed, Asst. Surgeon, is granted leave of absence for four months, to take effect about September 1, 1890. With the approval of the Acting Secretary of War. Par. 17, S. O. 192, A. G. O., Washington, August 18, 1890.

PROMOTIONS.

Asst. Surgeon Francis J. Ives July 25, 1890: To be Asst. Surgeon with the rank of Captain, after five years' service, in accordance with the Act of June 23, 1874. A. G. O., Hdqrs. of the Army, Washington, August 11, 1890.

First Lieut. William P. Kendall, Asst. Surgeon U. S. Army: To be Asst. Surgeon with rank of Captain, after five years' service, from August 12, 1890. A. G. O., Hdqrs. of the Army, Washington, August 18, 1890.

RETIREMENT.

Brigadier General John Moore, Surgeon-General, August 16, 1890 (Act of June 30, 1882). A. G. O., Hdqrs. of the Army, August 18, 1890.